The New England
Journal of Medicine

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Volume 237 JULY 3, 1947 Number 1

CANCER OF THE RECTUM*

An Analysis of Cases Occurring in Connecticut during 1935–1945†

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IN 1935 a plan was inaugurated in Connecticut whereby duplicate copies of hospital records of patients with cancer were made available to the Division of Cancer Research of the Connecticut Department of Health. This was a joint undertaking sponsored by the Tumor Committee and the Association of Tumor Clinics of the Connecticut State Medical Society, the general hospitals of the state, and the State Department of Health. As a result of fortuitous co-operation, complete data on over 35,000 cases of cancer have been collected and are now available for analysis.

This study is concerned with all cases in which a diagnosis of cancer of the rectum was made in the eleven-year period from 1935 to 1945 inclusive. The patients were admitted to twenty-seven general hospitals, representing approximately 95 per cent of all general-hospital beds in the state. Ward as well as private patients were included, so that no economic level was ignored. The patients were treated by many surgeons in both large and small hospitals. Complete follow-up data were obtained in over 97 per cent of cases. A significant and perhaps unique attempt is therefore made to present a true picture of cancer of the rectum on a state-wide basis.

Incidence

Cancer of the rectum represented between 4 and 5 per cent of all cases of the disease (Table 1). Although the admission rate of patients with cancer per 100,000 population rose from 131.1 in 1935 to 256.0 in 1945, the percentage of patients with cancer of the rectum rose proportionately to maintain an incidence of 4 or 5 per cent.

In the eleven-year period, 1610 patients were admitted to hospitals with the diagnosis of cancer of the rectum. Of these cases, 1188 were proved microscopically, and in 422 the diagnosis was made clinically. Only six hospitals had more than 100 cases of cancer of the rectum in the period, and the total number of cases was 983, or 61 per cent of the grand total; twenty-one hospitals had less than 100 cases, representing 39 per cent of the total. Of the microscopically proved cases, 777, or 65.5 per cent, were found in the hospitals with more than 100 cases, and 411 cases, or 34.5 per cent, were discovered in the others.

TABLE 1. *Mortality and Admission Rates for All Cancer and Incidence of Cancer of Rectum.*

YEAR	AGE-ADJUSTED MORTALITY FOR ALL CANCER	CRUDE MORTALITY FOR ALL CANCER	ADMISSION RATE FOR FOR ALL CANCER	ADMISSION RATE FOR CANCER OF RECTUM	INCIDENCE OF CANCER OF RECTUM
	per 100,000	*per 100,000*	*per 100,000*	*per 100,000*	*%*
1935	111.6	133.3	131.1	6.8	5.2
1936	107.3	132.5	136.5	5.5	4.0
1937	107.3	132.3	150.0	6.1	4.1
1938	114.9	143.9	153.4	7.1	4.6
1939	112.3	143.0	179.0	8.0	4.5
1940	118.3	153.1	171.5	8.2	4.8
1941	117.6	154.1	195.0	9.4	4.8
1942	118.0	157.6	202.1	8.2	4.0
1943	118.4	160.9	210.0	10.0	4.8
1944	118.5	169.5	209.0	10.4	5.0
1945	114.2	160.2	256.0	10.4	4.1

The incidence of proved cases rose from a low of 58.7 per cent in 1935 to a high of 83.3 per cent in 1942. In this period 73.9 per cent of cases were proved microscopically. In the hospitals with more than 100 cases, 79 per cent of cases were proved microscopically, and in the others only 65.6 per cent were proved (Table 2). Although, in the absence of microscopical evidence of cancer, no scientifically valid conclusions can be drawn, in a high percentage of the unproved cases a diagnosis of cancer of the rectum seemed justifiable. Furthermore, the longevity curve of 220 unproved cases in the first six years coincided almostly exactly with that plotted by Daland, Welch and Nathanson[1] for 100 untreated cases of cancer of the rectum, 35 per cent of which were proved microscopically, and with a similar curve plotted for 67 untreated proved cases in this series. For these reasons, wherever it appears to be

*Presented at the annual meeting of the New England Surgical Society, Worcester, October 4, 1946.

†The tables and analyses are from the registry of the Division of Cancer and Other Chronic Diseases, Connecticut State Department of Health, Hartford, Connecticut.

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of importance, data on unproved as well as proved cases are presented to obtain a broad comprehension of the present status of cancer of the rectum in the state.

Age

The age distribution in the total proved and unproved cases is presented in Table 3. Slightly over 60 per cent of patients with proved diagnoses were between fifty and sixty-nine years of age. About 7 per cent were below the age of forty, and nearly 20 per cent were above seventy. In the proved cases, there were 19 patients under thirty. The average age for the total proved and unproved cases was 61.3 years, and for proved cases alone, 63.2 years. The average age for the occurrence of cancer of the rectum is greater than that in other gastrointestinal cancers, and the Connecticut series had a larger proportion of patients in the age groups above seventy than is usually found in the literature.

TABLE 2. *Distribution of Cases according to Microscopical Proof.*

YEAR	MICROSCOPICALLY PROVED CASES		CASES NOT PROVED		TOTAL CASES
	NO.	PERCENTAGE	NO.	PERCENTAGE	
1935	68	58.7	48	41.3	116
1936	66	68.0	31	32.0	97
1937	80	69.0	36	31.0	116
1938	93	75.0	31	25.0	124
1939	100	70.4	42	29.6	142
1940	108	77.2	32	22.8	140
1941	139	80.8	33	19.2	172
1942	119	83.3	24	16.7	143
1943	130	71.5	52	28.5	182
1944	149	78.0	42	22.0	191
1945	136	72.8	51	27.2	187
Totals	1188		422		1610
Averages		73.9		26.1	

TABLE 3. *Age Distribution.*

AGE	TOTAL PROVED CASES		TOTAL PROVED AND UNPROVED CASES	
yr.	NO.	PERCENTAGE	NO.	PERCENTAGE
0–9	0	0.0	0	0.0
10–19	1	0.0	2	0.1
20–29	18	1.5	21	1.3
30–39	61	5.2	74	4.6
40–49	146	12.3	171	10.6
50–59	349	29.4	429	26.6
60–69	374	31.5	497	30.8
70–79	201	16.9	333	20.6
80–89	32	2.7	68	4.2
Over 90	0	0.0	4	0.2
Unknown	6	0.5	11	1.0

TABLE 4. *Hereditary History of Cancer in Microscopically Proved Cases.*

RELATIVE	HEREDITARY HISTORY OF CANCER		HEREDITARY HISTORY OF CANCER AT SAME SITE	
	NO.	PERCENTAGE	NO.	PERCENTAGE
None	492	41.5	542	45.6
Father	26	2.6	12	1.1
Mother	40	3.4	19	1.6
Brother	15	1.3	7	0.6
More than one brother	2	0.2	2	0.2
Sister	20	1.7	9	0.8
More than one sister	0	0.0	0	0.0
Not specified	573	48.2	564	47.4
Aunts, uncles and others	19	1.6	7	0.6
Unknown	20	1.7	23	1.9

Heredity

On the basis of proved cases alone, 4.9 per cent of patients had relatives with cancer at the same site, and in 2.7 per cent of these cases the relative was a parent (Table 4). It should be pointed out that information on heredity was not obtained in 48.2 per cent of cases. If this number of patients is deducted from the total, and rates are based only on cases known to have been questioned, 19.8 per cent had relatives with cancer, and 9 per cent had relatives with cancer of the rectum. The figures are too small to be conclusive, however.

Signs and Symptoms

The usual presenting symptoms were rectal bleeding, weight loss and some change in bowel habit (Table 5). Local pain and tenesmus were also frequent. The high incidence of weight loss, abdominal pain and vomiting attests to the advanced stage of many cases. Over 11 per cent of patients gave hemorrhoids as the first symptom, and many of these patients had been treated surgically before the cancer was discovered.

TABLE 5. *Presenting Symptoms.*

SYMPTOM	NO. OF CASES	PERCENTAGE
Bleeding	812	51.7
Weight loss	602	38.4
Constipation	595	37.9
Frequent stools	438	27.8
Abdominal pains	329	21.0
Local pain	326	20.7
Tenesmus	176	11.2
Hemorrhoids of over six months' duration	132	8.4
Vomiting	128	8.2
Mucus	106	6.8
Polyps	91	5.8
Rumbling of gas	76	4.8
Urinary symptoms	69	4.4
Hemorrhoids of less than six months' duration	46	2.9

In addition, about 20 per cent of patients were found to have some complicating organic disease, notably of cardiovascular origin (Table 6). Diabetes was present in 2.3 per cent, and gastric ulcer in 1.0 per cent of cases. These incidental findings are

TABLE 6. *Complicating Diseases on Admission.*

DISEASE	NO. OF CASES	PERCENTAGE
Hypertension or arteriosclerosis	156	10.0
Heart disease	75	4.7
Diabetes	36	2.3
Gastric ulcer	16	1.0
Kidney disease	13	0.8
Pernicious anemia	6	0.4

probably not unusual in the light of the age groups involved.

Duration of Symptoms

The average delay between the onset of first symptoms and receipt of treatment is presented in Table 7. The median delay in 1935 was 11.2 months.

TABLE 7. *Delay between Onset of First Symptoms and Treatment.*

YEAR	DELAY OF ONE MONTH	DELAY OF FOUR MONTHS	DELAY OF SIX MONTHS	AVERAGE DELAY
	%	%	%	mo.
1935	10.0	31.0	43.6	11.2
1936	7.9	27.8	43.4	8.9
1937	16.4	31.0	51.0	6.9
1938	18.3	45.0	59.1	5.8
1939	17.2	35.8	47.8	7.8
1940	17.0	39.0	53.9	6.6
1941	18.5	39.7	56.0	6.1
1942	21.4	40.0	55.0	6.6
1943	17.6	41.2	54.6	6.5
1944	22.3	46.1	54.8	6.3
1945	20.0	41.0	55.0	6.6

In the subsequent two years, the average dropped to 6.9 months, but no appreciable improvement has occurred in the past eight years. The median delay seems to be fixed between six and seven months. The percentage of patients receiving definitive treatment within one month of the first symptom, however, has doubled in eleven years — from 10 to 20 per cent. The percentage of those receiving treatment within four months has risen from 31 to 41 per cent, and within six months from 44 to 55 per cent.

Diagnosis

Delay in the recognition of cancer of the rectum should be minimal in view of the striking early symptoms, which focus the attention of both the

TABLE 8. *Results of X-ray Diagnosis.*

NO. OF CASES EXAMINED	POSITIVE FINDINGS		NEGATIVE FINDINGS		QUESTIONABLE FINDINGS	
	NO.	PER-CENTAGE	NO.	PER-CENTAGE	NO.	PER-CENTAGE
438	348	79.6	43	9.7	47	10.7

patient and the physician on the lower bowel. Furthermore, in most cases, by the time the first symptoms appear, the disease has already been present sufficiently long to be discovered easily by a careful digital examination. Proctoscopic examination, as well as biopsy, is of value in revealing the few cases that may be difficult to detect with the finger. The value of x-ray diagnosis is indicated somewhat in Table 8.

Only 37 per cent of patients with proved cases had an x-ray examination. In slightly over 20 per cent the diagnosis was either negative or doubtful. In some Connecticut clinics, radiologists, cognizant of this wide margin of error, now do digital examinations on every patient referred for a barium enema.

Histologic Grade of Cancers

Connecticut clinics use only three histologic grades. Tissues that might be interpreted as Grade IV according to Broders's[2] classification are included in Grade III. Of the microscopically proved cases 123, or 10.3 per cent, were classified as Grade I, and 582, or 49.0 per cent, as Grade II; thus, nearly 60 per cent of cases were either Grade I or Grade II. Only 110 cases, or 9.3 per cent, were Grade III. In 31.4 per cent the grade was not stated, which

TABLE 9. *Resectability according to Year of Admission.*

YEAR	RESECTIONS	PROVED CASES	RESECTABILITY OF PROVED CASES	TOTAL CASES	TOTAL RESECTABILITY
			%		%
1935–1940	237	515	46.0	735	32.2
1941	66	139	47.5	172	38.4
1942	65	119	54.6	143	45.5
1943	78	130	60.0	182	42.9
1944	93	149	62.4	191	48.7
1945	82	136	60.3	187	43.9
Totals	621	1188		1610	
Averages			52.3		38.6

may or may not reflect a trend away from grading in the state.

Stage of Disease

The extent of the growth in all cases was described as either localized, with involvement of regional lymph nodes or with remote metastases, corresponding in general to Dukes's[2] classification of A, B and C. In the entire period 707 cases (59.5 per cent) were localized, 316 (26.6 per cent) showed regional involvement and 116 (13.9 per cent) had remote metastases on admission. The number of localized cases was 309 (60.0 per cent) between 1935 and 1940 and 398 (59.2 per cent) between 1941 and 1945. The number of patients admitted between 1935 and 1940 with regional involvement — 117, or 22.7 per cent — increased over 6 per cent in the last five-year period, — 199, or 29.5 per cent, — and this coincided with a drop from 89 (17.3 per cent) to 76 cases (11.3 per cent) with remote metastases in the corresponding periods.

Resectability

Resectability is determined essentially by the skill and experience of the surgeon, as well as by his attitude toward the choice of radical surgery as a palliative measure in the presence of extensive disease.

In the eleven-year period, the average number of patients admitted annually to the twenty-seven

hospitals was 108. It is apparent that under the present system no one surgeon in the entire state has had an opportunity to do a large series of cases. This must be considered in the evaluation of the

TABLE 10. *Resectability according to Number of Admissions.*

SOURCE OF DATA	TOTAL PROVED AND UNPROVED CASES	TOTAL PROVED CASES	RESECTIONS	RESECTABILITY OF PROVED CASES	TOTAL RESECTABILITY
				%	%
Hospitals with more than 100 admissions for cancer of rectum	983	777	425	54.7	43.2
Hospitals with fewer than 100 admissions for cancer of rectum	627	411	196	47.7	31.3
Totals	1610	1188	621		
Averages				52.3	38.6

resectability rates presented in Table 9. The rate rose from a low of 46 per cent for the years 1935–1940 to a high of 62.4 per cent in 1944. The rate for the entire period was 52.3 per cent. These

TABLE 11. *Procedures in Microscopically Proved Cases.*

TREATMENT	NO. OF CASES		PERCENTAGE	
Resection	621		52.3	
One-stage		463		74.6
Two-stage		158		25.4
Colostomy	275		23.1	
None	105		8.9	
Miscellaneous	76		6.4	
Local excision	49		4.1	
X-ray and radium	32		2.7	
Refused treatment	30		2.5	

figures, however, are based on microscopically proved cases only. If all cases are considered, proved and unproved, the rate ranged from 32.2 per cent to 48.7 per cent, and was 38.6 per cent for the entire period. None of the patients with unproved cases had resections, but a different significance is attached to the rates when they are based on total cases rather than on microscopically proved cases alone.

The resectability rate in hospitals with more than 100 cases was 7 per cent higher for proved cases, and 12 per cent higher for total cases, than that in hospitals with less than 100 cases (Table 10).

Treatment

Radical resections were performed in 621, or 52.3 per cent, of microscopically proved cases and in 38.5 per cent of all cases. The procedures in the microscopically proved cases are presented in Table 11. Local excision was performed in 49 cases, usually those with polyps that had undergone malignant change. Only 2.7 per cent were treated by radiation alone, although a number of cases in the miscellaneous group were treated by radiation combined with some operative procedure.

TABLE 12. *Distribution of Resections.*

YEAR	ONE-STAGE PROCEDURES	TWO-STAGE PROCEDURES	TOTALS
1935–1940	131 (55.3%)	106 (44.7%)	237
1941	48 (72.7%)	18 (27.3%)	66
1942	51 (78.5%)	14 (21.5%)	65
1943	71 (91.0%)	7 (9.0%)	78
1944	87 (93.5%)	6 (6.5%)	93
1945	75 (91.5%)	7 (8.5%)	82
Totals	463 (74.6%)	158 (25.4%)	621

Of the 275 patients who had colostomies, 41 also had some form of radiation. The operative mortality for colostomies was 28 per cent. A careful study of the records of these cases was made to determine why radical treatment had not been attempted. Some of the patients were candidates for a two-stage resection, but did not survive the colostomy. Other cases were obviously inoperable, and colostomy was attempted as a palliative measure. Approximately 25 per cent of patients seemed to be in good condition on admission, and radical resections might have been attempted in bolder and more skillful hands.

Of the 105 patients for whom no treatment was recommended, 45 per cent were over seventy years of age, about 50 per cent were considered to be in poor general condition, and over 21 per cent had remote metastases on admission. The average duration of life from the first symptom to death for this group was 21.3 months.

The unproved cases were treated as follows: colostomy, 214 cases; no treatment, 187 cases; radiation, 15 cases; and miscellaneous, 6 cases. No unproved case was submitted to radical resection.

TABLE 13. *Age Distribution according to Treatment (Microscopically Proved Cases).*

TREATMENT	AVERAGE AGE	PATIENTS UNDER 40	PATIENTS 40–59	PATIENTS 60–69	PATIENTS 70 AND OVER	AGE NOT SPECIFIED
	yr.	%	%	%	%	%
Resection	57.7	7.0	47.8	33.1	11.9	0.2
Colostomy	61.1	6.2	39.4	26.9	25.9	1.6
Local excision	61.7	8.2	32.6	28.6	30.6	0.0
None	64.9	1.0	27.6	37.1	33.3	1.0
X-ray and radium	65.0	0.0	25.0	43.7	31.3	0.0
Refused treatment	68.0	0.0	26.6	26.8	46.6	0.0
Miscellaneous	56.3	18.4	38.2	25.0	18.4	0.0
Averages	63.2	6.7	41.7	31.5	19.6	0.5

Of the 621 resections, 74.6 per cent were one-stage abdominoperineal operations, and 25.4 per cent were performed in two stages, either by the Lahey[3] method or by colostomy followed by perineal resection (Table 12).

There was a striking increase in the frequency of one-stage resections during the eleven-year period. Between 1935 and 1940 one-stage operations represented 55.3 per cent of total resections, and 44.7 per cent were done in two stages. In the past three years, over 90 per cent of resections were performed in one stage.

Of all resections, 45 per cent were done on patients over sixty years of age. The age distribution for all forms of treatment is presented in Table 13.

TABLE 14. *Operative Mortality following Radical Resection.*

YEAR	ONE-STAGE RESECTIONS	OPERATIVE DEATHS	TWO-STAGE RESECTIONS	OPERATIVE DEATHS	ALL RESECTIONS	OPERATIVE DEATHS
1935–1940	131	33 (25.2%)	106	26 (24.5%)	237	59 (24.9%)
1941	48	8 (16.7%)	18	5 (27.8%)	66	13 (19.7%)
1942	51	5 (9.8%)	14	3 (21.4%)	65	8 (12.3%)
1943	71	16 (22.5%)	7	1 (14.3%)	78	17 (21.8%)
1944	87	15 (17.3%)	6	3 (50.0%)	93	18 (19.4%)
1945	75	11 (14.7%)	7	4 (57.2%)	82	15 (18.3%)
Totals	463	88 (19.0%)	158	42 (26.6%)	621	130 (20.9%)

TABLE 15. *Causes of Postoperative Deaths.*

CAUSE	NO. OF CASES	PERCENTAGE
Peritonitis	23	17.7
Surgical shock	22	16.9
Cardiovascular failure	21	16.2
Pulmonary embolism	11	8.4
Pulmonary complications	10	7.9
Urinary complications	8	6.2
Paralytic ileus	10	7.7
Miscellaneous	7	5.4
Not stated	18	13.8
Total	130	

Operative Mortality

The rising resectability rate has been accompanied by a lowering of operative mortality (Table 14). In the period 1935–1940 resections were performed in 237 cases, with an operative mortality of 24.9 per cent. Between 1941 and 1945 resections were done in 384 cases, with a mortality of 18.4 per cent. Similarly, in the period of 1935–1940 one-stage resections were done in 131 cases, with a mortality of 25.2 per cent. In the last five years, one-stage resections were performed in 332 cases, with a mortality of 16.5 per cent. In 1945 the mortality for one-stage resections had dropped to 14.7 per cent.

TABLE 16. *Factors Influencing the Five-Year-Cure Rate in 515 Cases.*

FACTOR	TOTAL NO. OF CASES	FIVE-YEAR CURES	
		NO.	PERCENTAGE
Age in years:			
Below 40	69	9	13.0
41–50	26	10	38.5
51–60	108	19	17.7
61–70	127	14	11.0
Over 70	185	6	3.2
Sex:			
Males	298	30	10.0
Females	217	28	12.3
Stage of disease:			
Localized	309	49	15.8
Regional involvement	117	9	7.7
Remote metastases	89	0	0.0
Metastases:			
None	291	49	16.9
Present on admission	187	9	4.8
Developed after admission	37	0	0.0
Histopathologic grade of tumor:			
I	53	11	20.8
II	220	26	11.8
III	54	3	5.6
Not stated	188	18	9.6

The mortality for two-stage resections was 24.5 per cent between 1935 and 1940, and 26.6 per cent for the entire period. Since the number of one-stage resections increased, two-stage operations were obviously reserved for the patients regarded as poor risks.

TABLE 17. *Five-Year End Results.*

RESULT	ALL MICROSCOPICALLY PROVED CASES		CASES WITH RESECTION	
Unknown:	12		8	
Death from other cause, without recurrence	10		7	
Patient lost to follow up, probably without recurrence	2		1	
Failure:	445		192	
Death from cancer	420		180	
Patient lost to follow up (probably dead)	13		4	
Survival, with recurrence	12		8	
Cure (patient free from disease)		58 (11.5%*)		37 (16.1%*)
Totals	515		237	

*Percentage of known results.

Causes of Death

The causes of postoperative death are presented in Table 15. The most frequent ones were peritonitis and shock. The next most important was cardiovascular failure, including cerebral hemorrhage, myocardial failure, mesenteric thrombosis and ruptured aneurysm. Pulmonary embolism accounted for 8.4 per cent of deaths, and pneumonia and atelectasis for 7.9 per cent. Urinary complications caused 6.2 per cent of deaths.

Factors Influencing Cure

Data on factors that have been considered to influence curability are based on cases admitted in the six-year period 1935–1940 (Table 16). Above the age of forty years there appears to be a steady drop in five-year-cure rates as the age increases. Little difference is manifested between the sexes.

TABLE 18. *Survival and Cure Rates on the Basis of Complete and Selected Totals in General Use.*

Basis of Estimate	Total Cases	Five-Year Survivals		Five-Year Cures	
		No.	Percentage	No.	Percentage
Total admissions	735	94	12.8	58	7.9
Total proved cases	515	85	16.5	58	11.2
Proved cases with known results	503	85	16.9	58	11.5
Total resections	237	60	25.3	37	15.6
All resections except cases with remote metastases	214	57	26.6	37	17.3
All survivals	178	57	32.0	37	20.8
Survivals without remote metastases	161	57	35.4	37	23.0

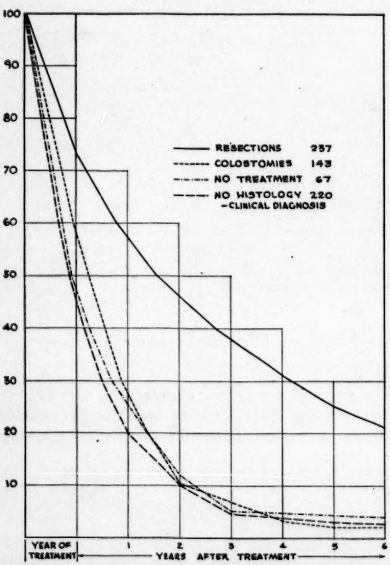

FIGURE 1. *Percentages of Survivals after Hospitalization for Cancer of the Rectum (based on the 1935–1940 records of twenty-seven general hospitals).*

Localized growths and a low histologic grading appear to be favorable factors.

Results

In reviewing the literature on cancer of the rectum in the past ten years, one is impressed with the lack of uniformity in reporting end results. This makes for ambiguity of interpretation and difficulty of comparison. In this series the method of computing five-year cures suggested by Martin[4] was employed. Strict and logical criteria are established for determination of cure, and accurate follow-up study in over 90 per cent of cases is necessary. On this basis, five-year cures were obtained in 11.5 per cent of the 515 proved cases with known results observed during 1935–1940, and in 16.1 per cent of the resected cases (Table 17).

This estimation of cures, however, does not take into account the relatively large number of unproved cases. With the view of advocating the adoption of a standard method of reporting end results, the estimate was revised (Table 18). The variety of results that may be claimed, depending on the basis used for calculation, is apparent.

Beginning with a five-year-cure rate of 7.9 per cent based on all cases and a five-year survival rate of 12.8 per cent, there is a progressive rise to an optimistic figure of 35 per cent as different denominators are used. Statistics thus computed show the possibilities of accomplishment in selected cases, but tend to obscure the total picture.

Comparative longevity curves in resected cases, cases in which colostomies were performed, cases in which no treatment was given and unproved cases are presented in Figure 1.

* * *

Although a detailed and critical analysis of the findings is not possible in this presentation, sufficient information has been submitted to indicate the value of collecting cancer statistics on a statewide basis.

A continued effort must be made to reduce the time lag between the first symptom and definitive

treatment. The signs and symptoms of cancer of the rectum are sufficiently striking to warrant early recognition by both the patient and the physician.

Biopsy should be performed in all cases if an accurate appraisal is to be made.

Operability and mortality rates are improving, owing perhaps to the use of antibiotics in the prevention and treatment of sepsis, a better understanding of the management of shock and phlebitis and the more widespread employment of trained physician-anesthetists. Further improvement might be possible if some plan could be adopted of concentrating the care of these cases in a few centers.

For the six-year period 1935–1940, five-year cures were obtained in only 7.9 per cent of all cases. In the microscopically proved cases 11.5 per cent of patients were cured at the end of five years. More favorable results can be shown in selected cases, as reported in the literature. This suggests that a uniform method of reporting end results is highly desirable in the interest of a precise evaluation of the status of cancer of any organ.

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Discussion

Dr. Ashley W. Oughterson (New York City): Ten years ago, the Connecticut Tumor Society inaugurated this program, and this paper that we have had the privilege of hearing today is the first summary of 1610 cases of cancer of the rectum out of a total of more than 35,000 cancer cases.

Connecticut doctors should be congratulated, since this represents some of the best of medicine as a social science, and there has been a great trend in recent years toward considering medicine a social science.

The general practitioner, the specialist, the State Department of Health and the hospitals have joined in a co-operative effort to discover what happens in one of man's most insidious and dangerous diseases.

The paper just presented is important, because, to my knowledge, it represents the first time in America that a cross section of the population has been studied as treated and diagnosed by a cross section of the physicians. Such a study, and the remainder of these facts in Connecticut as they are brought out, should provide us with the sinews for the war against cancer, to point the way to what is needed and to indicate the effectiveness of cancer control.

These results are obviously not so favorable as they could have been, but they are not so poor as they might have been. Much has been heard of the results in the large hospitals and clinics, which have performed a great service in showing what can be done, but by this time we know that their results are good and we need to hear more of the other side of the story.

Medicine as a social science cannot be judged solely by the results in the large hospitals and clinics. One must go to the average hospital inhabited by the average patient, who is treated by the average physician, to evaluate the position of medicine as a social science.

This material is extraordinarily valuable at the present moment, because of the attack on cancer in which many of us are engaged in inaugurating and guiding. The large sums of money that are becoming available raise a pertinent question — how this money should be spent. It has been stated that 30 to 50 per cent of patients with cancer can be saved by the proper or adequate use of the methods that are available. I doubt whether that figure is accurate, because to my knowledge the facts have not been obtained from a cross section of the population.

Here, for the first time, is a co-operative effort within a state to furnish that information, so that by proper analysis it can be stated with reasonable accuracy, after this study is completed, what can be accomplished by education in the use of the methods that are available. Then it can be determined how much of the national resources of money, men and materials should be spent on the use of the weapons at hand while research for the future is being conducted.

No one knows when the cause of cancer or a new means of cure will be discovered. Many authorities actually doubt whether there will be a universal cure. It is therefore imperative at present, when promises of what will be done to cure cancer are being made, to obtain concrete results.

INFECTIOUS HEPATITIS WITH SUBACUTE ATROPHY OF THE LIVER*

An Epidemic in Women after the Menopause

M. JERSILD, M.D.†

COPENHAGEN, DENMARK

AN unusual and serious epidemic of infectious hepatitis has been present in Denmark since 1944. It differs from epidemics previously described in that the course has been extremely malignant and the disease, which is usually fatal, occurs almost exclusively in women after the menopause.

In 1945 attention was called to this form of hepatitis in Denmark,[1] and several other observers have had similar experiences.[2–4] Since in most patients the disease progresses in a characteristic and uniform manner, the symptoms by which it has generally been manifested in our department are described below.

As a rule the patient is an elderly or middle-aged woman. For a month or two she has suffered from lassitude, epigastric oppression, loss of appetite turning to an aversion to food and nausea. Occasionally, vomiting occurs. The patient is hospitalized for gradually increasing jaundice, which begins after the initial stage described above. At times the first symptom is a brief febrile period or perhaps diarrhea. During the subsequent course, however, the temperature is seldom high; the icterus varies in intensity but is often only moderate. It may last until exitus, but this is not the rule. The jaundice often has a tendency to recede while the patient is confined to bed, although this does not justify a more favorable prognosis. Since icterus may vary greatly within a relatively short time and there often are colicky pains in the right upper quadrant, it is not surprising that the differential diagnosis from cholelithiasis is difficult.

In the icteric stage the patient's appetite usually decreases. She complains of a bad taste in the mouth. The lassitude grows, and she may spend the whole day drowsing. Five or six months after the onset the patient is usually troubled by increasing ascites and edema. She may lie for months in this condition. With parched mucosa, ecchymosis, decubitus ulcers, massive ascites and edema, the patient is a wretched sight before passing at last into the phase of hepatic coma — an event that usually happens ten or twelve months after the appearance of the first vague symptoms.

The post-mortem findings are just as characteristic as those of the clinical picture. Usually, the liver is extremely atrophic, weighing only 600 to 800 gm. Even macroscopically the lesion seems distinguishable from the ordinary portal cirrhosis. The surface is lighter in color than normal. In some areas there are small islands of preserved liver tissue, differing from the surrounding areas by their yellowish color and projecting somewhat from the general surface, which shows many retractions due to areas of atrophy where the liver cells are replaced by connective tissue. The cut surface shows similar features. Here, too, the predominant feature is the homogeneous connective-tissue stroma, with scanty areas of preserved liver tissue.

On microscopical examination the central part of the acinus is seen to be the site of degenerative changes, with incipient inflammatory infiltration. The central vein and capillaries are dilated, and the liver cells atrophic and necrotic.There is proliferation of the Kupffer cells and infiltration with leukocytes, lymphocytes and phagocytic cells. In the periphery of the acinus the liver cells are preserved fairly well, being arranged in columns or trabeculae. This is the picture encountered at a relatively early stage. When the process is more advanced, the greater part of the original liver parenchyma has disappeared, leaving merely scattered small islands of liver cells; the rest of the organ is made up of connective tissue rich in cells, with isolated groups of vessels.

The changes correspond exactly to the picture of subacute yellow atrophy of the liver described by Bergstrand[5] in 1930, or to that in protracted cases of liver atrophy described by Lucké[6] in 1944. Microscopically, the lesion differs distinctly from portal cirrhosis, in which the changes seem to have begun in the periphery of the lobule.

Even at an early stage liver-function tests indicate a grave parenchymatous lesion. The Takata reaction, which must be emphasized as a reliable test, is strongly positive in nearly all cases of chronic hepatitis. The icteric index is moderately high as a rule, fluctuates to some extent during the course of the disease and in the terminal stage may show normal values. The urobilinogen in the urine is generally increased. The thymol reaction is usually markedly positive, and the sedimentation rate increased, as is the relative globulin content of the serum.

The following is an account of the epidemic of chronic hepatitis observed since 1944 at Bispebjerg Hospital, Department B, chiefly among elderly and middle-aged women. For comparison I have collected all cases of infectious hepatitis recorded in the Department from 1928 to 1945, a total of 550 cases. Of these, 396 followed an acute course, — that is, the duration was under three months, — and

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This study was supported by a grant from the P. Carl Petersen Foundation.

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154 were chronic — of more than three months' duration.

Figure 1 shows that the number of chronic cases increased rapidly in 1944 and 1945, the total in these

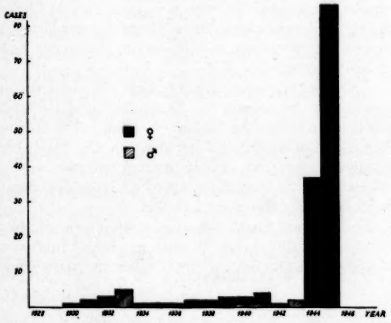

FIGURE 1. *Infectious Hepatitis of More Than Three Months' Duration at Bispebjerg Hospital (Department B) during 1928-1945.*

two years being 123, whereas in the foregoing sixteen years there had been only 31 cases. It also appears that during the epidemic the chronic cases oc-

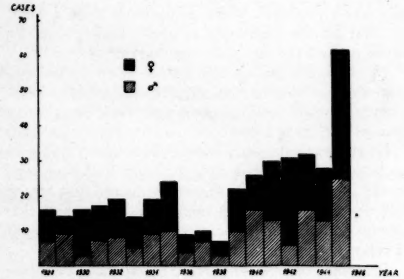

FIGURE 2. *Infectious Hepatitis of Less Than Three Months' Duration at Bispebjerg Hospital (Department B) during 1928-1945.*

curred almost exclusively among women (1 male and 122 female patients).

Figure 2 presents the distribution of the 396 acute cases. The incidence was about equally distributed between the sexes, despite the fact that the women's department is larger than the men's.

Figure 3 comprises all cases of infectious hepatitis reported to the authorities from all over the country. It will be observed that there were two epidemics, the maximum number of cases occurring in one in 1933 and in the other in 1943; in the latter year there were 18,000 cases of infectious hepatitis (six times more than the normal) throughout the country, whose total population is 4,000,000.

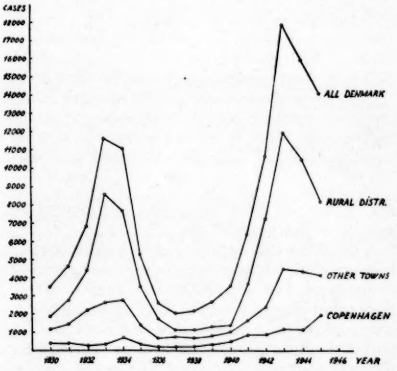

FIGURE 3. *Infectious Hepatitis in All Denmark and Various Districts during 1930-1945.*

Figure 4 presents the fatal cases of infectious hepatitis, including acute and chronic atrophy of the liver. During the 1944–1945 epidemic 75 patients died, only 1 of them being a man; thus, nearly 99 per cent of the fatal cases occurred in women. Of all hospitalized patients with infectious hepatitis in these two years 35 per cent died, and in all cases with a duration of over three months the mortality

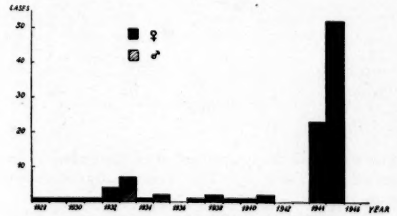

FIGURE 4. *Fatal Cases of Infectious Hepatitis, according to Sex, at Bispebjerg Hospital (Department B).*

was 67 per cent. It is probable that this extremely high mortality will increase when the period of observation is lengthened.

Chronic hepatitis occurs chiefly in patients above fifty years of age (Table 1); 71 per cent of patients were over fifty, and 90 per cent over forty years, whereas the acute form usually affected people chiefly between the ages of fifteen and thirty. Eighty-

TABLE 1. *Age Distribution in Infectious Hepatitis.*

AGE yr.	CHRONIC CASES*	ACUTE CASES†	FATAL CASES
0–14	2	43	0
15–30	6	188	—
31–40	6	76	3
41–50	30	41	8
Over 50	110	48	64
Totals	154	396	75

*More than three months' duration.
†Less than three months' duration.

five per cent of the patients who died in 1944–1945 were over fifty years of age.

A characteristic feature of chronic hepatitis is the long preicteric phase in which the patients complain of tiredness, loss of appetite and weight. Table 2 shows that during the 1944–1945 epidemic the preicteric phase lasted more than a month in 64 per cent of the chronic cases, and in 32 per cent the duration was over two months. In 100 successive cases of acute hepatitis the preicteric phase lasted less than fourteen days in 92 per cent.

Ascites and edema are frequent complications in chronic hepatitis. These symptoms generally occur simultaneously. Of 123 patients 66 per cent had edema and ascites, in most cases about six months after the first manifestation of the symptoms; 6 of the patients never had jaundice. The duration of the chronic hepatitis, determined from the appear-

TABLE 2. *Duration of Preicteric Phase.*

DURATION wk.	CHRONIC CASES	ACUTE CASES
Less than 1	15 (14%)	60 (60%)
1–2	8 (7%)	32 (32%)
2–3	10 (9%)	5 (5%)
3–4	7 (6%)	2 (2%)
4–8	35 (32%)	1 (1%)
Over 8	36 (32%)	0
Totals	111	100

ance of the initial symptoms, in 75 fatal cases is presented in Table 3. The average duration was nine months.

The fulminant occurrence of malignant, protracted hepatitis in women after the menopause seems to be unique and has not previously been described in epidemics in or outside Denmark.

During an epidemic in Sweden in 1928 Bergstrand[5] found that 72 per cent of the malignant cases of hepatitis occurred in women. There, however, the affection was apparently acute atrophy of the liver, terminating fatally in the course of from four to six weeks. Of Bergstrand's patients 37 per cent were women over forty-five years of age.

Lucké[6] describes 125 fatal cases during an epidemic of hepatitis among soldiers in 1942. Here again, acute atrophy of the liver led to death in four to six weeks. In both Bergstrand's and Lucké's material the preicteric initial phase did not last more than two weeks as a rule, as in the acute cases described above.

The natural assumption is that this is a disease previously unknown in Denmark and differing markedly from the ordinary form of infectious hepatitis. The chronic hepatitis in the 1944–1945 epidemic occurred chiefly among elderly women, whereas acute hepatitis attacked younger people with no particular regard to sex.

The chronic form often has a preicteric phase of several months' duration, with gradually increasing tiredness and nausea, whereas acute hepatitis gener-

TABLE 3. *Duration of Hepatitis in 75 Fatal Cases 1944-1945.*

DURATION mo.	NO. OF CASES	PERCENTAGE
1–3	7	9
4–6	18	24
7–9	17	23
10–12	14	19
13–15	8	11
16–18	7	9
19–21	3	4
Over 21	1	1

ally has a preicteric phase of no more than a week, so that at the beginning of the jaundice one can often predict the course of the disease.

In chronic hepatitis the icterus often varies considerably in degree; sometimes, it subsides completely, even if the disease progresses. This is rarely true of the acute form.

Of the patients with chronic hepatitis 4 had previously had infectious hepatitis and had been well in the meantime. This suggests that the first attack left no immunity to the next one. Acute hepatitis rarely occurs more than once in the same patient if relapses are disregarded.

It seems possible for chronic hepatitis to be transmitted by contact, and for the person so infected the course is equally grave. In 4 cases of chronic hepatitis the lesion possibly arose through contact with other patients. These 4 patients were elderly women who for some time had nursed their respective female relatives who had been suffering from chronic hepatitis. The disease had an incubation period of up to two months in the 4 cases and followed a fatal course in the contacts as well as in the original patients.

There are certain points of resemblance between serum hepatitis and this chronic form. According to Findlay et al.,[7] Havens[8] and Neefe, Stokes and

Gellis,[9] serum hepatitis has a long incubation period and sometimes a graver course than infectious hepatitis. It has never been demonstrated that serum hepatitis can infect by contact, nor in fact has such transmission been proved in chronic hepatitis. Since the infectious substance of serum hepatitis can be transmitted on the point of a knife that has been wiped after blood sampling from the ear, there does not seem to be anything improbable in transmission via an insect bite. Among the nurses in the department there has been no case of chronic hepatitis, although no special measures were taken to avoid infection.

I should not neglect to raise the question of whether these elderly women had suffered under dietary insufficiency, especially a protein deficiency. Since they were by no means particularly poor or underfed, this possibility may be ignored, especially because none of them presented signs of dietary insufficiency; indeed, no such symptoms were observed in Denmark during the war.

A feature common to almost all women with chronic hepatitis is that they had passed the menopause. In several of the younger patients with chronic hepatitis the menses failed while the affection lasted, sometimes for more than a year. On this basis it is tempting to assume that in some way the female sex hormone has a bearing on the course of the infection. The fact seems established that the estrogens are neutralized in the liver,[10–12] and certain hormonally conditioned changes have been observed in patients with liver lesions, such as gynecomastia and atrophy of the testes in males with cirrhosis of the liver.[13]

So far as the excretion of estrogens in this form of hepatic lesion is concerned, nothing has been done beyond certain initial investigations. Nevertheless, it is a problem that may become of practical importance, if it should turn out that in women the estrogens exert some form of liver-protecting influence against the infection.

Summary

An account of an epidemic of chronic hepatitis in Copenhagen in 1944–1945 is presented. In a single department of a hospital 123 patients were treated for the disease, which is characterized by a protracted course (over three months) and by the occurrence of ascites and edema. Over 99 per cent of cases occurred in women. The mortality was high — 61 per cent. The disease chiefly affected women after the menopause, 79 per cent of patients during the epidemic being over fifty years of age, and is often characterized by a long preicteric phase — more than four weeks in 64 per cent — in contrast to acute infectious hepatitis, in which the preicteric phase in 92 per cent of patients was less than two weeks. The average duration of the disease in the fatal cases was nine months.

The possibility of a special malignant virus is emphasized, and the question is raised whether estrogens exert some form of liver-protecting influence against this particular infection.

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BOSTON MEDICAL LIBRARY

Report of the President*

IT IS an annual custom for the President to inform the fellows of the condition of the Library. It is my pleasant duty to present my first annual report.

The status of medical libraries in Boston has been a subject of discussion for some years. In 1941 a survey of this situation was made by Mr. Thomas P. Fleming, medical librarian of Columbia University, and his comprehensive report was studied by a committee consisting of Mr. Fleming and Drs. John F. Fulton and Robert N. Nye. This committee brought out the following points:

> In general, medical institutions in Boston have excellent resources of medical literature within relatively easy access.
>
> The physical facilities of the working libraries in the medical schools are in need of considerable readjustment.
>
> The administration of all working libraries has not attained general standards of medical libraries in other parts of the country.
>
> The Boston Medical Library is centrally located and has sufficient storage space for many years to come, particularly in view of the facilities offered by the New England Deposit Library.
>
> The Boston Medical Library, because of lack of funds, is understaffed and does not furnish the type of service, regarding either quantity or quality, that is to be expected.
>
> The future of the Boston Medical Library, particularly in view of present-day attempts to eliminate decentralization and duplication, hinges about its development as a *reference library*, for the benefit not only of Boston and its immediate vicinity but also of the rest of Massachusetts and the other New England states.

The committee recommended that steps be taken to actuate these observations.

The trustees have endeavored to find ways and means of accomplishing at least some of these suggestions. The results have been discouraging. Dr. Cheever, in his last annual report, described in detail the various attempts to get more income. A drive for more fellows has brought in perhaps $2500 more, the professional members at $50 each have increased somewhat and the Suffolk District Medical Society and several special societies have been most generous. In spite of this, our income has averaged only about $30,000 a year, and without expanding at all we run behind about $1000 a year. That the Library has been able to offer any reasonable service has been due to the untiring efforts of our librarian, Dr. Viets, and of our director, Mr. Ballard, and his small but devoted staff.

A library of over 200,000 volumes and almost as many pamphlets, to say nothing of its almost priceless collection of incunabula, Hebraica, early medical-history and biographic collections, which are of national importance, certainly deserves better and more widespread support.

The Massachusetts Medical Society and the Boston Medical Library have grown up hand in hand. The founders of the Library were all members of the Society. Although the Massachusetts Medical Society gave its books to the Boston Public Library in 1872, it was apparently satisfied to turn to the Boston Medical Library as a place for its meetings and its general headquarters, and in February, 1879, it was voted: "That the treasurer of the Society be authorized to conclude arrangements with the Boston Medical Library Association by which councilors of the Massachusetts Medical Society, together with its standing committees, . . . may hold their meetings at the rooms of the Library Association during a term of ten years. . . ." The Library has continued to be the headquarters of the Society ever since. In June, 1885, a recommendation of the Committee on Library, through Dr. Z. B. Adams, stated that the library of the Massachusetts Medical Society consisted mainly of reports of various medical societies, and it was voted: "That that property and all similar publications hereafter received be given to the Boston Medical Library on condition that they be accessible to members of the Society."

The Massachusetts Medical Society assumed ownership of the *New England Journal of Medicine* in 1921, and during the years that the *Journal* staff has occupied offices in the Library building, there has been a close and cordial association. The editor is treasurer of the Library, and the *Journal* deposits its books received for review with the Library.

The intimate association of these two societies appears to have been mutually beneficial during the years, and there seems to be no reason to believe that they should not continue so for many years to come. Indeed, there have been several attempts to a closer relation and even a suggestion of an actual merger of the two societies under the name of an academy of medicine. When these possibilities were more carefully explored it was found that the legal obstacles in the way were insurmountable, largely because of the many trust funds held by the Library for special purposes.

A well equipped and well staffed reference library is an essential branch of medicine both for the

*Presented at the annual meeting of the Boston Medical Library, March 4, 1947.

practicing physician and for the research worker. The Library offers its service to all members of the medical profession in Massachusetts, whether or not they are fellows. It occupies the same relation to the physicians of the Commonwealth that a free public library does to the citizens of its community. The citizens support a public library by means of taxes willingly enough, although many of them never use it. They recognize that it is a necessary adjunct to society as a whole. So should the medical profession consider the Boston Medical Library an adjunct to the profession of medicine in Massachusetts and be glad and willing to support it.

It seems logical then that the Massachusetts Medical Society, which represents over five thousand out of perhaps eight thousand physicians in Massachusetts, should be glad and willing to assume some of the financial responsibility of the Library and thus allow it to put its house in order, enlarge its personnel and offer the reference-library service for which it is otherwise well equipped.

It is a pleasure to report that this has been accomplished. When the Executive Committee of the Council and the Council itself were presented with the facts, they were convinced that the Library could not function as a great library should without the help of the Society. It was therefore voted that $5.00 out of the increased annual dues be allocated to the Boston Medical Library, with the sole provisos that it be legal and that every member of the Society be made a member of the Library in some category.

Our counsel, who is also counsel for the Massachusetts Medical Society, has rendered an opinion that the Massachusetts Medical Society may lawfully contribute toward the support of the Library. The matter of membership requires some change in the by-laws, and the trustees have authorized me to appoint a special committee to consider this matter. It will be necessary for the fellows to act on any report that may be rendered, and you may expect to be called in special meeting at some time in the near future.

This generous response of the Massachusetts Medical Society will give us next year an added income of over $25,000. We may lose some fellows, particularly in the nonresident category, but it is hoped that loyalty to the institution and a sense of ownership in the Library will persuade most to retain their fellowships.

So far as plans for the future are concerned, we are fortunate in having the wise and sympathetic counsel of Mr. Keyes D. Metcalf, Director of Libraries of Harvard University. He is intensely interested in our problem, has made a survey of our needs and has offered certain recommendations. I shall leave the discussion of these, for the most part, to our librarian, Dr. Viets. I should like to make a few comments, however.

Mr. Metcalf's first suggestion is to make the Library a first-rate reference collection and, to accomplish this, to weed out unwanted medical and nonmedical books and periodicals and deposit them in the New England Deposit Library. At their last meeting the trustees voted to take this first step without delay. They authorized the Librarian to take space in the New England Deposit Library and to carry out the weeding process little by little during the summer. Books placed in this deposit library will always be available on reasonable notice. This will give us room enough to sort out volumes accumulated in odd places and to place them properly on shelves.

Another necessary undertaking is the completion of the union catalogue of the holdings of all the medical libraries in the Boston area, so that the Boston Medical Library can take its place as the central institution among them. The basis for this catalogue already exists on cards, but the system is far from complete.

We must in the near future give some consideration to the establishment of a pension system for our employees, who, it must be remembered, are not eligible for Social Security benefits.

I hope that we shall be able to put away a little money each year toward the completion of the stacks in the stack building and the elevator to serve them. Five floors of stacks are yet to be completed. Perhaps after we complete our new organization and put our house in order, a special drive for funds should be made for this purpose.

Although there are probably many obstacles in the way of complete realization of our ideals, we are at least embarked on the voyage. I am sure that with the loyal help and support of the fellows, the trustees will give their time and thought to the various problems as they arise to enable us to furnish the type of library service that the Boston Medical Library is well equipped to offer.

WALTER G. PHIPPEN

Report of the Librarian*

IT IS again the privilege of the Librarian to present to the Corporation of the Boston Medical Library his annual report — in this instance, his ninth accounting of the state of the Library. You, as fellows of the Library and owners of the building and its contents, will wish to know whether adequate service has been rendered to our readers, how well the collection has been maintained and what plans are contemplated to carry forward the fundamental aims of the Library in the next few years. The goal in general is the ever-elusive one of complete usefulness to its users, both private and public, of the entire contents of its collections, continually enriched by the addition of treasures from the past and a judicious selection of the medical literature of the present.

Service to Readers

Both the use of the Library and the attendance increased greatly in 1946 over 1945. The circulation of books reached a total of over 38,000 — an increase of more than 20 per cent. This is nearly the average of the prewar years, for in 1940 and 1941 about 40,000 items were taken off the shelves for our readers each year. During World War II the number fell to about half, indicating how much the Library is used by the younger members of the profession. The same trend is shown by the attendance figures. In 1946 over 10,000 visits were made to the Library. The figure, an increase of 46 per cent over 1945, is about the average for the prewar years.

We thus resumed in 1946 our usual activity both in the number of readers and the number of items that they used. The collection was made available in a satisfactory manner in spite of some delays due to the shortage of personnel. The interlibrary loans more than doubled in 1946, showing that the Library is being used frequently for purposes of research by other institutions. We are thus rendering an excellent service in furnishing material to the Harvard University libraries, the libraries of the Boston hospitals and other institutions nearby, as well as those at a distance. The Library was used by the Newton–Wellesley Hospital, the Rhode Island Medical Society in Providence, Smith College in Northampton, the United Shoe Machinery Company in Beverly, the Winchester Public Library and many others. Our largest interlibrary loan service at present, as it should be, is to the Veterans Bureau hospitals. We have sent books, however, all the way from Bar Harbor, Maine, to Dallas, Texas, and San Francisco, California, and even some interested reader from Myrtle Beach, South Carolina, sought a book that presumably could not be found elsewhere. In the course of the year, our members used the Library over twenty-five hundred times and on the average took out ten books or journals apiece. The fellows used about 60 per cent of their books in Holmes Hall, and 40 per cent were taken home. There were three times as many visitors as there were fellows, but they used only half as many items. This proportion seems proper and indicates that we are serving our fellows well and, in addition, taking care of the needs of our visitors, mostly students. On the two evenings a week that the Library is open we draw only a small percentage of our total members but a much larger number of visitors.

Growth and Maintenance of the Library

As predicted a year ago, the Library contains over 200,000 volumes, and the pamphlets number 140,000, a collection of 340,000 medical items being thus available to the medical profession in Boston and its vicinity, as well as to scholars throughout the country. The Library added about the usual number of books and periodicals in 1946. A large group of French theses were deposited by the Harvard Medical School Library. As might have been expected after the war years, the number of periodicals taken currently by the Library increased from 578 in 1945 to 723 in 1946. Most of the increase was in foreign-language periodicals, a gain from 44 to 139. We are not up to the record number of journals received in 1937, — namely, 907, — but this is largely accounted for by the fact that only 2 German periodicals were received in 1946. The foreign journals of the war years, 1940–1945, however, are beginning to come in. Early in 1947, the German periodicals for the years 1940 and 1941 were received and many of the Dutch, Scandinavian, Swiss, French and Italian journals from 1940 to 1945 have also been placed on our shelves. Our book dealers in Europe, old and loyal friends of the Library, kept files so far as possible of all medical periodicals, and it was a pleasure again to open packages of large contributions from Nijhoff in The Hague, Le François in Paris, Nardecchia in Rome, Enslin in Berlin and Haus der Bucher in Geneva. An active foreign exchange was continued with the Soviet Union, and about 27 of the current Russian medical periodicals were received; some of these sets are nearing completion. In exchange we are sending standard American medical periodicals to Russia, and later we hope to expand into books and pamphlets. We are also receiving Russian journals from the Harvard Medical School Library, and plans are being worked out to centralize all Russian medical literature in Boston in the Boston Medical Library.

The Library is still falling behind in the binding of its periodicals, only 378 volumes of the 723 periodicals received being bound in 1946. We thus

*Presented in part at the annual meeting of the Boston Medical Library, March 4, 1947.

added to our accumulation of volumes needing binding. The division of current literature, most used by the fellows, should be kept up to a high degree of standard by an increase in the number of periodicals and by the binding of those that are extensively used.

The Future

The available stacks are overloaded with books and periodicals; volumes and loose numbers of journals and pamphlets have to rest on the floor. To provide for future accessions, we should build the new addition to our stacks immediately or seek room elsewhere for the storage of little-used material. Possibly, the character of accessions should be changed so that fewer books and journals come into the Library each year. Of the solutions proposed to meet our needs, the new stacks seem to the Librarian the most important, and he again calls the attention of the fellows to the great need for building the remaining tiers of the stacks, already so useful in their abbreviated form. The building is ready to house them, and we can probably arrange to get the steel to complete the seven additional tiers.

Another method of lesser value is being employed for immediate relief. Arrangements have recently been made to take over a section of the New England Deposit Library in Cambridge, and this will become available to us on July 1. The New England Deposit Library was established about six years ago under the auspices of Harvard University, and a building erected on Western Avenue in Brighton in the rear of the Harvard Business School. Space in this building is now rented by the Boston Public Library, the Boston Athenaeum, the Massachusetts State Library and other neighbor libraries. More than half the space is used by the Harvard College Library. At present the entire building is filled with books, except for a quarter of one floor. This space has been allocated to the Boston Medical Library and will be fitted with metal stacks built close together in eleven and a half double-faced ranges. A range consists of nine sections 3 feet in width, making a total of 27 feet in length, and each section contains seven, eight or nine shelves, depending on the height of the books. The total number of linear feet available for shelving is about 2000, and on an estimate of eight or nine volumes to a foot, the space will accommodate about 20,000 books. Thus, the little-used material will be available either at the Deposit Library itself or for daily transportation back to the Boston Medical Library. Books and other material designated for the New England Deposit Library will be moved after July 1, for this material has already been partly earmarked and a considerable portion is segregated in boxes piled on top of the present two tiers of stacks in the new stack building. Some books, moreover, will be removed from the old stack room, and by the use of the Deposit Library, even though our new stacks are not built within a year or two, the Library will be in reasonably good condition so far as shelving in the immediate future is concerned.

What should be the aim of the Boston Medical Library in the future? It cannot continue to develop as a universal medical library, for it has neither the space nor the money. The Library must change its course without, in general, changing the principles for which it was founded. Book-collecting activities should be delimited, and the Library developed into a first-rate working research collection, rather than a universal collection in the field of medicine. Delimitation should be based on three aims: certain aspects in book collecting in which the Boston Medical Library should have a strong or inclusive collection; those in which a good up-to-date representation is sufficient; and those in which a comparatively small sampling is all that is needed. The first category consists of strong groups of current medical journals in all languages and from all countries. We should receive more than a thousand current medical periodicals, and provision should be made to bind and house them conveniently on our shelves. In addition, the latest textbooks, monographs and current editions of all sound medical publications should be acquired, particularly in the field of clinical medicine. In the second category, the fields allied to medicine, we should have an up-to-date representative collection of books on chemistry, physics, biology and so forth. We should not expand completely into this field, for books of this type are available at other libraries in or near Boston. Through a mutual understanding and interlibrary loan system, volumes called for in these categories could easily be obtained for our readers. Finally, we need a sampling of the greatest books in medical history. Many of these have already been acquired by the Library, but we should keep up our strong collection of medical history, biography, bibliography, literary medicine, reference books and similar branches so far as our funds permit. There is no reason, moreover, why the Library should not welcome more funds for such a purpose, and the Librarian will certainly not look askance at a medical library of historical interest to supplement the collection along these lines. This, however, would not be the primary interest, and the Librarian does not contemplate turning the Boston Medical Library into an antiquarian society. Because of the impetus given to it in the past, however, because of funds already acquired and because of forces that bring things to a library so well housed and catalogued as ours, he does not worry about the continued care and augmentation of our special collections. Such books are, indeed, the working tools of the medical historian. As scholars learn about our collection of incunabula and other books of rare and important value, the Library becomes more and more used every year for his-

torical research. We are thus attempting to suit the working needs of the scholars of medical history as well as to supply all the needs of the members of the medical profession in Boston and in Massachusetts. Everyday working purposes should set the standards, however, rather than inclusive historical or bibliographic ends.

In addition, we need a weeding-out process. The Library should have had in years past what Osler always termed "an annual shed." Unfortunately, the Boston Medical Library has been primarily acquisitive for over seventy-five years, taking nearly all it could put its hands on and being rather proud of the growing collection. During this process we have not unnaturally added a certain amount of nonmedical material that should be discarded at once, and similar items should not be acquired in the future. Borderline material may be kept by the Library and deposited in the New England Deposit Library, where it is easily accessible when called for.

Relation with the Massachusetts Medical Society

The Library building has long been the headquarters of the Massachusetts Medical Society as well as the repository for our collection. In it are housed the offices of the Society and of the *New England Journal of Medicine*. That these organizations should seek a closer form of co-operation with the Library is not surprising, for the added support of the Massachusetts Medical Society to the Boston Medical Library will give to the medical profession in Massachusetts a proper solidarity not found in any other state in the Union except possibly in Maryland, where the Medical and Chirurgical Society maintains its own library in its own building. Thus, an opportunity is given to interweave the old with the new. All the records of the Massachusetts Medical Society, the early documents pertaining to medicine in the Commonwealth and items of every description regarding the practice of doctors and the lives that they led have already accumulated in abundance in the Boston Medical Library. For over seventy-five years, the Library has been the natural source for the collection and cataloguing of material, and by a gravitational process the libraries of physicians have been bequeathed in large numbers to the Library itself; thus, we have on our shelves a reflection of the past practice of medicine in Massachusetts, a portion of which has already been used in the *History of the Massachusetts Medical Society* and similar publications. The Library will continue to add everything that is pertinent to medicine in Massachusetts, for not only from books but also from manuscripts and private letters of our predecessors can a vivid picture of their lives and the times in which they lived be formed.

To these must be added the old books in medicine, for as Osler said, "Nothing utilizes the new more effectively than the presence of the old." Our special collections give the same tone to the Library as the portraits of ancestors by Stuart and Copley to the dining rooms of many houses. To the Librarian, all books are old, for nothing ages so quickly as a book. In a decade almost every medical book becomes, indeed, extremely old, and much of the immense literature of the past is not worth shelving, except for historical research, in the Boston Medical Library. We can be grateful that there is an institution in America, the Army Medical Library in Washington, where everything pertaining to medicine can be kept. Theirs is the duty of indiscriminate purchase; ours must be limited to a smaller field, primary consideration being given to the current literature and papers of local interest. Of course, we have had our enthusiasts, who are still welcome and who, for one reason or another, are attracted to a certain class of works, such as incunabula and books on special subjects. Money has been left to us for the purposes of developing these collections, and the Library will never forget its duty. Boston has always had many physicians with the happy combination of literary tastes, leisure and a long purse, and the Library collection reflects the interest of these men as do few libraries of medicine in the United States. Sometimes these interests are expressed in the field of medical medals, portraits, autographs, etchings or bookplates. Here again we should "hold fast to that which is good," for this sort of activity is far from making the Library a dumping ground for unwanted material. There is plenty of that, published mostly in the Seventeenth and Eighteenth Centuries, and the universal collection of material of this type does not fall into our province.

The Library is primarily an educational institution, devoted to the education of the doctor of our time. Every book and pamphlet on our shelves is of interest to someone, but the greatest use of the Library naturally comes with the current literature of all lands and in this we are, indeed, fortunate in the large number of journals, transactions of societies and reports that we accumulate year by year. With the co-operation of the other libraries in and near Boston the Library expects in the near future to be able to make available for the laboratory worker, the specialist and the general practitioner all the current literature that is worth while. Every book and journal may not find a place on the shelves, but should that work be available in Boston or, indeed, anywhere in the United States, the Boston Medical Library will bring it to the doctor's desk or his laboratory table.

In carrying out this idea, the Librarian held an informal conference with the librarians of schools and hospitals in and near Boston on December 7, 1946, to consider matters of mutual interest. Representatives of the Mt. Auburn Hospital Library, Tufts College Medical and Dental School

Library, New England Deaconess Hospital Library, Treadwell Library (Massachusetts General Hospital), Harvard Medical School Library and its departmental libraries, Harvard School of Public Health Library and the libraries of Boston University School of Medicine, Boston City Hospital, Boston Psychopathic Hospital, Beth Israel Hospital, Newton–Wellesley Hospital, Massachusetts College of Pharmacy, Massachusetts Department of Public Health and Massachusetts Department of Mental Health met to discuss policies of interlibrary loans, the coverage of special fields, exchanges between Boston libraries, the collection of ephemera and related materials and general cooperation regarding the development of the libraries in Boston and its vicinity with special reference to medical, dental and pharmacologic problems. Further meetings of this nature are planned, and there already has been set up a plan for activities that will benefit all the libraries participating in this conference.

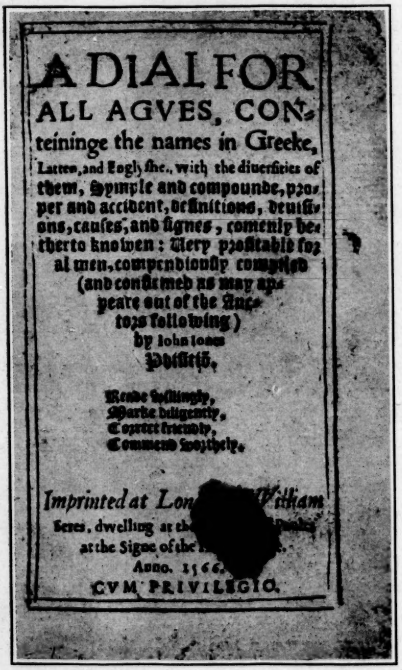
A DIAL FOR
ALL AGVES, CON-
teininge the names in Greeke,
Latten, and Englyshe, with the diuersities of
them, Symple and compounde, proper and accident, definitions, deuisions, causes, and signes, comenly hetherto knowen: Very profitable for all men, compendiously compiled
(and confirmed as may appeare out of the Auctors following)
by Iohn Iones
Medicus.
Reade diligently,
Marke diligently,
Correct friendly,
Commend worthely.
Imprinted at Lon[don] by [Will]iam
Seres, dwelling at th[e]
at the Signe of the
Anno. 1566.
CVM PRIVILEGIO.

FIGURE 1. *Title Page of* A Dial for All Agues, *by John Jones* (*London, 1566*).

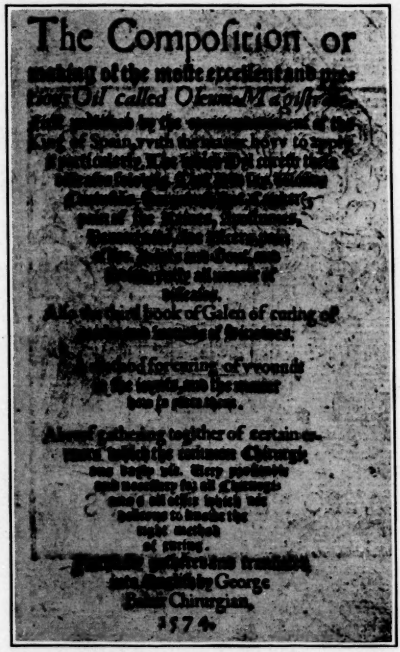
The Composition or
making of the moste excellent and
Oil called Oleum Magistrale,
by the
King of Spain, with the manner how to
Also the third book of Galen of curing of
for curing of woundes
Also of gathering together of certaine
Chirurgie,
Chirurgie
Chirurgian,
1574.

FIGURE 2. *Title Page of* The Composition or making of the most excellent and pretious Oil called Oleum Magistrale, *by George Baker* (*London, 1574*).

ACCESSIONS

The Library has added two medical manuscripts, a number of Sixteenth Century and Seventeenth Century imprints and eight English books, published before 1640. A fine collection of private letters written by Dr. Ezekial D. Dodge, and a dozen or more American imprints have also been acquired, including the second edition of *Morton's Letheon* (1846).

Two of our English imprints were acquired through the courtesy of Mr. William A. Jackson, of the Houghton Library. *A Dial for All Agues*, by John Jones, a Welsh physician, was published in London in 1566 (Fig. 1). Dr. Jones wrote a number of books on fevers, medicinal baths and general health measures. He was a fashionable physician of his

time who practiced in Bath and other parts of England. The title page contains the following quaint admonition: "Reade willingly, Marke diligently, Correct friendly, Commend worthely." Other copies of this rare black-letter book are recorded in the British Museum and the H. E. Huntington Library.

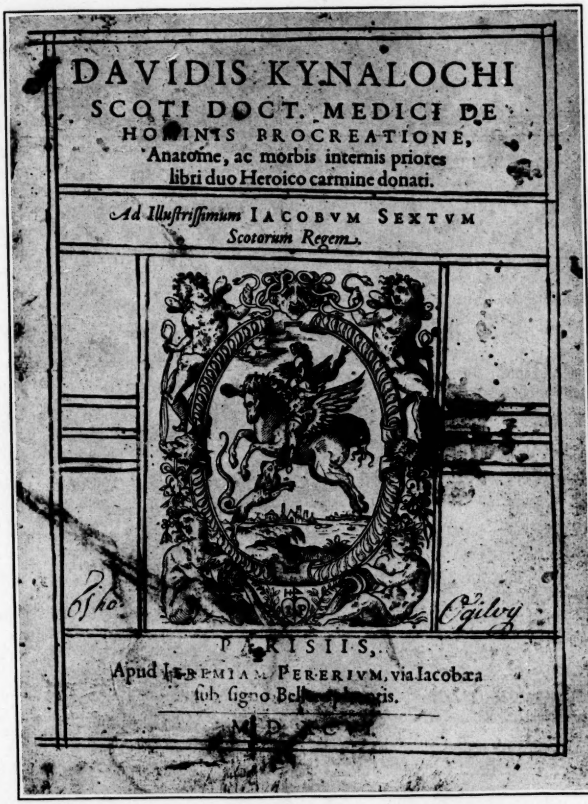
DAVIDIS KYNALOCHI
SCOTI DOCT. MEDICI DE
HOMINIS PROCREATIONE,
Anatome, ac morbis internis priores
libri duo Heroico carmine donati.
Ad Illustrissimum IACOBVM SEXTVM
Scotorum Regem.
PARISIIS,
Apud [illegible] PERERIVM, via Iacobæa
sub signo Bel[illegible]

FIGURE 3. *Title Page of* De Hominis Procreatione, *by David Kinloch* (*Paris, 1596*).

The second book, *The Composition or making of the most excellent and pretious Oil called Oleum Magistrale*, by George Baker, was issued in London in 1574 (Fig. 2). Baker, a member of the Barber Surgeons' Company, was attached to the household of the Earl of Oxford when he wrote on the *oleum magistrale*, a preparation of wine and herbs used for the cure of wounds, ulcers and other diseases. This active surgeon also translated the works of Conrad Gesner, Guido and Vigo into English. He was a friend of Clowes, the great contemporary surgeon, and of Gerard, the herbalist. Baker is best remembered for his work in writing on learned subjects in the vulgar tongue. Copies of Baker's *Oleum Magistrale* are recorded in the British Museum and Cambridge, England, but not in America.

A third work is a medical poem by a Scottish physician, David Kinloch, *De Hominis Procreatione*, published in Paris in 1596 (Fig. 3). The book is an early text on obstetrics. Little was known of Kinloch until the investigations of R. C. Buist[1] in 1926 disclosed that the author of these Latin verses was born in Dundee in 1559 and probably obtained

his medical degree in Paris in 1596, the year that his book was issued. Like many of his contemporaries, Kinloch was a great traveler. Tradition has it that when in Spain he was seized by the Inquisition and condemned to die. When the Grand Inquisitor became ill, Kinloch's services as a doctor were accepted, and after a cure had been effected, Kinloch was sent home to Scotland.

Finally, a pleasant edition, in Italian, of one of the most popular medical books ever written, *Thesaurus Pauperum di messer Pietro Hispano*, printed in Venice in 1531, was added to our collection (Fig. 4). Of the incunabula editions of Peter of Spain's famous compilation, five in Italian and one, the first, in Latin, only single copies are usually recorded in libraries throughout the world. The Boston Medical Library has the fourth edition in Italian, the only example of this printing in America. Some of the other editions, including the first Latin and the first Italian, are available to American scholars in the Army Medical Library. After 1500, more frequent printings of the *Treasury of the Poor* were demanded, since it had become the most popular book of its kind in the Sixteenth Century. This was at least partly due, as Sarton reminds us, to its brevity and to its practical nature. In addition to the 1531 Italian imprint the Library has the first printing in English, issued in London about 1550, and the first Spanish edition of 1532. The title page of the *Thesaurus* of 1531 shows a patient presenting to the physician a bottle of urine for diagnosis. The doctor in turn gives to the patient the appropriate diagnostic slip from a stock of them in a bag at his feet. Peter of Spain — or more accurately, Peter of Portugal, since he was born in Lisbon — was the son of a physician. He studied medicine in Paris and Siena, became a cardinal in 1273 and Pope John XXI in 1276, only to die by accident eight months later. Peter also wrote a treatise on diseases of the eye, many commentaries and a book on logic.

FIGURE 4. *Title Page of* Thesaurus Pauperum, *by Pietro Hispano (Venice, 1531).*

LIBRARY ACTIVITIES

Exhibits

The Library took part in a number of important exhibits in 1946. A special exhibit in the Whitney Museum of Modern Art in New York in October and November and also a continuation of this exhibit at the Museum of Fine Arts in Boston was augmented by our collection of drawings by Dr. William Rimmer. During the centennial of the First Public Demonstration of Ether Anesthesia, held primarily at the Massachusetts General Hospital on October 16, 1946, the "Ether Painting," by Robert Hinckley, which hangs in Ware Hall, was restored, prior to the exhibit at the hospital, through the kindness of our former president, Dr. David Cheever. The most significant parts of our ether collection were on exhibit in the Treasure Room at the Boston Public Library during October and November.

Gifts

The Library has received many special gifts through the kindness of a wide variety of individuals and libraries. Particularly valuable is a collection of French theses and Dutch and Spanish dissertations received from Harvard Medical School. The Suffolk District Medical Society made a grant of money to the Boston Medical Library in the sum of $1350. Dr. David Cheever presented a substantial sum for the purpose of restoring the Hinckley picture, and Dr. Dwight O'Hara gave money to encourage the use of the meeting halls in the Boston Medical Library by student organizations.

Meetings

The Director attended a meeting in honor of Miss Marcia D. Noyes, long the librarian of the Medical and Chirurgical Faculty of the State of Maryland, the meeting of the Medical Library

Association held in New Haven, Connecticut, and a meeting of the Honorary Consultants of the Army Medical Library, in Washington. The last meeting was also attended by the Librarian.

Book Reviews

The Library is rapidly getting up to date with book reviews and book notices. These fell behind in the early part of the year owing to the absence of many reviewers in the armed forces and the shortage of space in the *New England Journal of Medicine* for their publication. Toward the end of the year an active endeavor was made to bring this matter up to date, and by the beginning of 1947 the situation was greatly improved. Reviews of some books were not published in the *Journal* for over a year after receipt. It is now expected that reviews, or at least notes on books, can be published within two or three months after the receipt of the item by the *Journal*. Much of this depends on the good will of our reviewers, who should act promptly or return the book to the Library if they are unable to review it. Secondly, an effort is being made to publish reviews promptly in the *Journal*. The paper shortage, however, is still acute, and the editor reports that it may not be possible to find space to publish all the reviews as promptly as desired.

Publications

Recent articles emanating from the Library are as follows:

Seventieth Annual Report of the Boston Medical Library for the Year 1945. 40 pp. Boston: privately printed, 1946.

Viets, H. R. Nathan P. Rice and *His Trials of a Public Benefactor*, New York, 1859. *Bull. Hist. Med.* **20**:232-243, 1946.

Editorial. First description of rickets. *New Eng. J. Med.* **235**:144, 1946.

Cheever, D. Boston Medical Library: Report of the President. *New Eng. J. Med.* **235**:709-711, 1946.

Viets, H. R. Boston Medical Library: Report of the Librarian. *New Eng. J. Med.* **235**:711-717, 1946.

Editorial. Bigelow's original announcement. *New Eng. J. Med.* **235**:769, 1946.

Ballard, J. F. *Boston Medical Library Medical Classification*. Part Two — Index. Third edition, revised. 97 pp. Boston: privately printed, 1946.

VARIA

We were pleasantly reminded of some chapters in the history of the medical school at Cambridge by the late Sir Walter Langdon-Brown,[2] who revived our interest in John Caius, William Gilbert, Francis Glisson, William Heberden, Clifford Allbutt and their contemporaries in a series of brilliant papers delivered before the History of Medicine Section of the Royal Society of Medicine and now issued in book form.

Professor G. Grey Turner[3] retold the history of the Hunterian Museum at the Royal College of Surgeons of England, and for the first time in detail we learned of the tragic bombing and fire of May 10, 1941, with the loss of many treasures, leaving the main rooms of the building a hollow shell. About two thirds of the total collections were destroyed, but fortunately many of the original Hunter specimens survived along with the great life-size statue of Hunter, which had been encased in stout brickwork. It is cheering to know that the museum will be reconstructed and that John Hunter's work will still be a source of inspiration to medical men throughout the world.

From a sister institution, the Royal College of Physicians of London, comes the belated Fitz-Patrick Lectures, planned but not delivered in November 1939, and now printed by the College. The story of the medical interchange between the British Isles and America before 1801 was delightfully told by Archibald Malloch,[4] librarian of the New York Academy of Medicine, in a series of chapters devoted to various regions of America, such as the West Coast, the Colonial States, the West Indies, the Maritime Provinces and Canada. A valuable chapter deals with medical books reprinted in America before 1801.

HENRY R. VIETS

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2. Langdon-Brown, W. *Some Chapters in Cambridge Medical History*. 119 pp. Cambridge University Press, 1946.
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4. Malloch A., *Medical Interchange between the British Isles and America before 1801*. Based on the Fitz.Patrick Lectures of the Royal College of Physicians of London for 1939. 143 pp. London: Royal College of Physicians, 1946.

CLINICAL NOTE

SOLITARY UNICAMERAL CYST OF THE OS CALCIS

CHARLES C. VERSTANDIG, M.D.*

NEW HAVEN, CONNECTICUT

A REVIEW of the literature reveals a surprisingly low incidence of solitary cysts of the os calcis. The most recent report is that of Copelman et al.[1] Only 12 cases are recorded in the literature; of these only 4 were reported by American physicians. The patients in Copelman's cases complained of pain on standing or walking, which was also the complaint in the case presented below. The case had been in the military service and was receiving disability for bilateral pes planus. He complained of aching in both feet, and there were clinical objective signs of marked relaxation of the longitudinal arches of both feet, as well as extreme pronation of both feet that was more marked on the left.

Roentgenographic studies of both feet in the lateral projections — on weight bearing — revealed a low triangular pattern produced by the head of the metatarsal and calcaneus. A large cystic lesion was observed in the left os calcis that measured 3.5 cm. in diameter (Fig. 1). The lesion was large, with a sharply marginated radiolucent area involving the anterior half of the os calcis. This lesion was of a pyramidal shape, lying parallel with the long trabeculations of the posterior half of the bone. The posterior segment of the cyst extended superiorly as high as the sulcus for the flexor hallucis longus, anteriorly as far as the trochlear process, posteriorly as far as the lateral process of the os calcis and inferiorly as far as the cortical portion of the plantar surface of the bone. The trabeculations of the cystic segment were ill defined, whereas the trabeculae of the posterior half of the calcaneus appeared normal. The cyst seemed to abut on and to expand the inferior and lateral cortex.

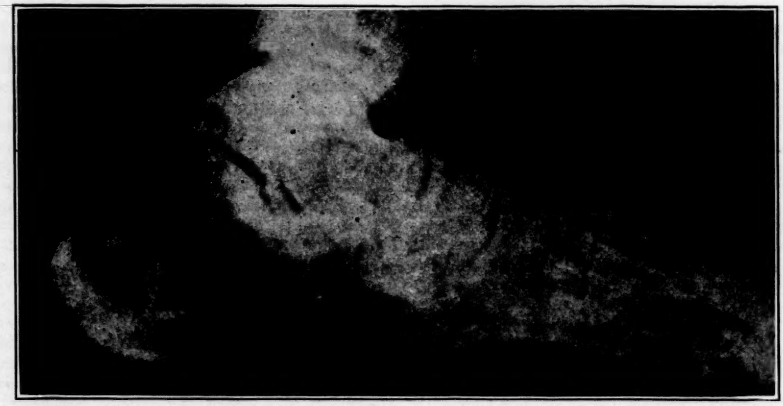

FIGURE 1.

described by Smith[2] was believed to be either osteitis fibrosa or a peculiar architectural anomaly. Brailsford[3] described a lesion of the os calcis that was identical in appearance with that in the case reported below. Brailsford called the lesion a "triangular area of osteoporosis." Jaffe and Lichtenstein's[4] survey of the records of the Hospital for Joint Diseases from 1925 to 1942 failed to reveal a single case of solitary unicameral cyst of the tarsal bones analogous to the type that occurs in long tubular bones.

CASE REPORT

A 28-year-old man was referred for roentgenographic studies of the feet in weight-bearing position. This patient

*Chief, Department of Roentgenology, Connecticut State Hospital, Middletown; consulting roentgenologist, Meriden Hospital, Meriden; consulting roentgenologist, Veterans Administration.

Solitary cyst of the calcaneus occurs in the same location in every case reviewed — that is, on the anterior, inferior and lateral aspects of the bone. The cyst is of the single type, with a well defined wall.

The appearance in all published cases is identical, but the lesion in the case reported above is probably the largest encountered.

SUMMARY

A single case of solitary cyst of the calcaneus is presented, adding to the 12 cases already reported in the literature.

The cyst always involves the anterior half of the os calcis.

As in other cases, the patient complained of pain on walking or standing.

129 Whitney Avenue

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MEDICAL PROGRESS

TUBERCULOSIS

JOSEPH D. WASSERSUG, M.D.*

QUINCY, MASSACHUSETTS

THE prolonged and chronic course characteristically pursued by tuberculosis is reflected in the slow progress that is being made in its conquest. The fatty armor that encapsulates the tubercle bacillus has only been dented, not destroyed, by man-made devices. Until some chemotherapeutic or antibiotic agent is found that will penetrate the inner defenses of this hardy microbe, progress in the field of tuberculosis will continue to resemble a series of skirmishes rather than a pitched, decisive battle.

CHILDHOOD TYPE

A clearer concept is developing concerning the so-called "childhood type" of tuberculosis and its relation to tuberculin sensitivity and pulmonary calcifications. Although it has been amply demonstrated in recent years that not all calcifications are due to tuberculosis, the question remains unanswered whether there is a loss in tuberculin sensitivity following the healing of known primary tuberculous lesions. If the primary complex is truly healed, does the child become tuberculin negative? If not, how long does tuberculin sensitivity persist?

To answer these questions Hardy[1] reviewed the records at the Harriet Lane Home Tuberculosis Clinic and selected 312 subjects (born between 1912 and 1930) who had had a primary tuberculous infection in childhood and who had been followed for at least seven years. In this group there were 193 Negroes and 129 Whites. All had had at least one positive tuberculin test, and 87 per cent had known contacts. Follow-up examinations revealed that tuberculin sensitivity was remarkably persistent during the period of study but varied considerably with the degree of infection received in childhood. In subjects who had had primary pulmonary infection, there was practically no loss in the degree of sensitivity, whereas of 171 persons who had had primary mediastinal tuberculosis, 2 per cent became anergic. Of the 82 remaining patients who had had only a positive tuberculin test without any associated roentgenologic findings, as many as 6 per cent became anergic. Thus, the greater the severity of the initial infection, the more persistent tuberculin sensitivity appeared to be. Conversely, it is likely that if calcifications are present and the tuberculin test is negative, tuberculosis is not responsible.

Another study, by Edwards and Hardy,[2] reveals that the degree of tuberculin sensitivity bears some relation to the prognosis. In 34 children who were relatively insensitive — that is, with reactions to not less than 1.0 mg. of tuberculin before their third birthday — there were no deaths, and no patients developed pulmonary calcifications or extrapulmonary lesions. There were no deaths in a group of 26 children who reacted to 0.1 mg. of tuberculin, but 3 patients showed subsequent calcifications on x-ray examination of the chest. In sharp contrast, in the highly sensitive group of 103 children who reacted to 0.01 mg. of tuberculin, 43 per cent had noncalcified parenchymal lesions, 62 per cent developed intrathoracic calcifications and 14 per cent died. Of 44 infants who gave vesiculate reactions to 0.1 mg. of tuberculin, 50 per cent developed parenchymal lesions, 77 developed intrathoracic calcifications and 16 per cent died. Thus, the degree of sensitivity in childhood may serve as a rough guide to the prognosis — the less sensitive the response, except, of course, in moribund patients, the better the prognosis.

The age of the patient at the time of infection also seems to bear a significant relation to the prognosis. The opinion of Kendig and Hardy[3] is as follows:

> The infected infant may be able to overcome tuberculous infection if the adult contact can be promptly removed. If, however, the contact remains and the baby is subjected to a constant opportunity for more infection, there is much greater likelihood of a serious, or even fatal, outcome.

It is wise to assume, therefore, that all subjects who show a positive tuberculin test before the age of three years have active infection. In such children, indeed, the infection has hardly had time to become inactive. More light on these problems may eventually be shed by the plan of study suggested by

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Biggs,[4] in which x-ray and clinical investigations are correlated.

Arrest of disease in childhood, as indicated by a calcified primary complex, may denote a truly healed lesion in the sense that the calcified lesions are no longer infective. To determine how frequently viable bacilli could actually be recovered from the primary complex of children dying of other causes, Feldman and Helmholz[5] collected material from 29 cases over a period of six years and inoculated the specimens into guinea pigs. In only 5 cases were viable, virulent tubercle bacilli demonstrated by the tests. The authors state:

> The failure to demonstrate the presence of living tubercle bacilli in 24 of 29 patients having childhood tuberculosis provides reasons for support of the belief that sensitivity to tuberculin in children may be transitory and that, in children whose tuberculosis is limited to the lesions of the primary complex, the continuation of the sensitivity to tuberculin is probably related to the infectivity of the tuberculous foci.

The age at which infection occurs appears to have a direct relation to the development of calcifications. High and Zwerling[6] studied 198 American-Indian children who developed tuberculosis while under observation and in 49 of whom calcifications later developed. Deposits of calcium were noted one to four years after the appearance of the lesion, usually during the second and third years. More than three fourths of the youngest patients developed calcifications, whereas calcium deposits were detected in only 2.4 per cent of the cases in which the onset of the disease was between the ages of fifteen and nineteen years. The presence of demonstrable pulmonary lesions appeared to influence the subsequent development of calcifications. One fourth of the patients who had pulmonary lesions subsequently showed calcium deposits. On the other hand, in cases in which tuberculin conversion was not accompanied by any demonstrable lesion, calcium appeared in only 2.2 per cent.

Although tuberculosis is extremely serious in infancy, the disease is relatively mild later in childhood. It is also true that the treatment of children with a primary complex, such as that afforded by a sanatorium, has no effect on the development of progressive tuberculosis in later life. Most competent investigators therefore believe that mass examination of children in grade schools should be abandoned.[7] High-school students can be examined more profitably, but, as Pope[7] points out, there is still some controversy regarding whether routine screening by the tuberculin test is desirable. Much, he says, depends on the region in which the tests are being done and on the type of x-ray equipment used. A final diagnosis of tuberculosis, however, should not be made on the first x-ray film, since a disturbing number of cases showing definite infiltrations of the lung fields will be found to have cleared completely on a re-examination two weeks later.[7] Although mass examination of high-school students for tuberculosis is popular with parents and school authorities, Pope suggests that general hospitals, industrial plants and mental hospitals are more profitable fields for discovering new cases.

The precise role that should be assigned to the tuberculin test in case finding is still a matter of dispute. Myers[8] has advanced persuasive arguments for routine tuberculin testing of all children, as well as adults, and has cited considerable evidence for its value in controlling tuberculosis in the Minneapolis area: "Twenty-five years ago, the tuberculin test was believed to be only applicable to children; but experience has taught that it is of great value in testing persons of any age." According to his point of view, any person reacting to tuberculin has tuberculosis just as certainly as the patient who is dying from the disease, the only difference being one of degree. Hilleboe[9] has prudently prefaced Myers's statements with the notation that this point of view is at variance with the conclusions of some other workers in the field. Tice,[10] of the Chicago Municipal Tuberculosis Sanatorium, presents a somewhat different approach to the problem.

Control

Although the x-ray apparatus detects pulmonary lesions more readily than the stethoscope, chest roentgenology has not yet advanced to the point where it can be substituted for logic or reasoning. Diagnosis is a function of logic, and the diagnosis of chest diseases, especially tuberculosis, depends on the correlation of clinical, roentgenologic and bacteriologic studies. No x-ray machine can do this. The diagnosis of tuberculosis or its degree of activity should never be based wholly on the x-ray report of the chest findings. "Never put your complete trust in shadows" is a sound medical adage that applies especially to tuberculosis.

Probably the most notable advance in the past year lies in the growing awareness of the fallibility of the x-ray machine and its limitations in the diagnosis of tuberculosis. Certainly, x-ray findings, alone, must never be used to determine the disposition of the patient. The chief exponent of this thesis is Hilleboe,[11] whose remarks should be compulsory reading for every physician who has occasion to send a patient to the sanatorium. He contends that many persons have been labeled as tuberculous wholly on the basis of the x-ray findings. "This is scientifically unsound," he says, "and . . . damage is done to people and to control programs." A patient with suspicious x-ray findings should, at least, have a complete history, a physical examination and sputum studies before the x-ray findings are tagged with a specific label. "Let treatment be delayed," urges Hilleboe, "until all the facts are in and all the evidence is evaluated." Persons who have tuberculosis that requires sanatorium care cannot be greatly harmed by a short delay of treatment; in many cases the disease has been present

for some time. Even those whose diagnosis is confirmed will profit by a period of waiting, during which they may become accustomed to the idea of having a serious disease. Similarly, in my opinion, the sending of a person who does not have tuberculosis to a sanatorium is tantamount to imprisonment without a fair trial. Worse still, it may expose a susceptible person — especially one who is tuberculin negative — to possible infection.

Other authorities agree that clinical conclusions drawn hastily from x-ray films are dangerous. A recent exhaustive report[12] emphasizes the fact that the personal equation enters significantly into the interpretation of chest films so that one man may read tuberculosis on a film at one time and may call the same film normal when it is reviewed.[12] The variation in interpretation among several observers is even greater. Shepard[13] also cautions against overlooking some of the limitations of the mass x-ray survey:

> We should not refer to the x-ray as the one and only way to diagnose tuberculosis. Even 14-by-17-inch stereoscopic plates will not provide a sure diagnosis, much less a single miniature film. Positive diagnosis of tuberculosis is a long, complicated, highly skilled process. . . . The x-ray is but a part of this process.

All the roentgenologist can and should do is to describe the type of shadows cast on the film, since shadows identical with those of tuberculosis may be cast by many diseases. Diagnosis should rest with the clinician, not the roentgenologist. In this connection, Rest[14] has cited many cases in which nontuberculous pulmonary conditions have been diagnosed as tuberculosis on the basis of the x-ray and the clinical findings. In every case, however, examination of the sputum was negative.

If there is so great a liability of diagnostic error in the routine mass x-ray surveys and even in the standard 14-by-17-inch films, it is difficult to understand how miniature photofluorography of the clothed subject can fail to add considerably to the existing confusion. Nevertheless, the experience of Lewis[15] indicates that, for mass surveys only, photofluorography of the clothed subject is without objection and that it has the advantages of speed of operation and reduction of space and personnel. Lewis, however, admits that this approach to the problem may be productive of a "narrow margin of error."

The general practitioner has often been glowingly referred to as the "keystone" in any tuberculosis-control program and, at the same time, has often been criticized for failing to put the full weight of his authority behind government-planned surveys or other publicly sponsored control measures. Too often, according to Hilleboe,[16] the control of tuberculosis is assumed to be the responsibility of the health department alone. Yet how can the assumption be otherwise when more and more of the physician's responsibility of diagnosis and treatment is being taken over by public-health authorities? How often, indeed, is the general practitioner asked to sit in the councils where tuberculosis programs are planned? Neither the state agencies nor the voluntary agencies seem to look to the practitioner for an opinion.

During the past decade or two, it seems to me, there has been a progressive narrowing of the opportunities available to an intern or resident — the future practitioner — to acquaint himself with the diagnosis and management of tuberculosis. General hospitals often prohibit the admission of tuberculous patients. Other hospitals provide only interim care until admission to a sanatorium can be arranged. As a result, training in tuberculosis is often inadequate and a quasi-conditioned reflex has been created among physicians so that the mere mention of the word "tuberculosis" carries an instantaneous connotation of "sanatorium." Lack of responsibility in the care of these patients during the period of training gives the physician a sense of insecurity both in diagnosis and management. Consequently, it has been necessary recently for public-health authorities to compile a guide for the physician in the disposition of persons with abnormal x-ray findings.[17] As valuable as this guide is, it is no substitute for the confidence gained from experience that a physician should have in the handling of all patients. To the dictum of Hilleboe and Holm,[17] "Do not diagnose pulmonary tuberculosis on the basis of an original x-ray film alone," should be added the corollary, "Not every patient with tuberculosis has to be in a sanatorium." Practically, all such patients can be studied at home, and some, if conditions are favorable, can be treated under the general practitioner's care with, perhaps, occasional advice from an expert. Only then will the general practitioner be an active participant in tuberculosis-control programs.

In spite of these considerations, it is gratifying to report the continuing decline of tuberculosis mortality. To those interested in some of the statistical aspects of tuberculosis control, the reports of Pitney and Kasius[18, 19] are recommended. The world-wide situation regarding tuberculosis prior to the war is briefly discussed and summarized by Yelton.[20]

Bacteriologic Considerations

Dubos and his associates[21, 22] have continued their researches on the growth of tubercle bacilli. Although tubercle bacilli are among the least exacting of pathogenic micro-organisms in their growth requirements, it is often difficult to initiate the growth of small inoculums in vitro. Furthermore, multiplication may be slow, even in some enriched mediums. Dubos and Davis[21] make the following observation:

> These characteristics render difficult the application to tubercle bacilli of a quantitative bacteriological method based on enumeration of living cells by plating or dilution techniques; they delay and at times prevent bacteriological diagnosis of tuberculosis; they hinder investigation concerned with pathogenesis, immunity, and chemotherapy.

Any technic providing for rapid growth and growth of small inoculums would therefore benefit many fields of investigation.

Such a technic appears to have been devised by Dubos and Davis,[21] who describe a modification of Kirchner's medium that is easy to prepare, as well as stable, and favors the growth of small inoculums. In such a medium, the growth-stimulating effect of certain synthetic water-soluble lipids — consisting of esters of long-chain fatty acids — is readily demonstrated. All these stimulating compounds possess both lipophilic and hydrophilic properties, and of these, the product marketed as "Tween 80" (the water soluble ester of oleic acid) was found to be the most satisfactory and the most reliable in its behavior. In the presence of such water-soluble esters the mycobacteria grow diffusely throughout the liquid medium rather than as a surface pellicle. Most important to the clinician is the fact that positive human sputums — after treatment with sodium hydroxide — inoculated into such mediums yield typical diffuse growth. Significant, too, is the fact that high agglutination titers for these new types of culture have been observed in some human serums.[22] The usefulness of these researches in the study of the immunologic response in tuberculosis is apparent.

Further investigation along some of the lines indicated above has been carried out by Foley[23] and Youmans.[24, 25] At the Massachusetts General Hospital, Foley utilized the depth-growth technics for recovery of tubercle bacilli in the examination of pathologic material sent routinely to the laboratory. An excellent correlation was obtained between the cultural results and those found on guinea-pig inoculation, especially when a small amount of human or bovine serum albumin was added to the culture medium. The incubation period in these cultures ranged from five to twenty-seven days, with a mean of eleven days, in sharp contrast to the period of eight to twelve weeks often required for diagnosis by guinea-pig inoculation. "This preliminary study," comments Foley, "suggests that with reasonable care in their use, these new synthetic media can be invaluable in the laboratory diagnosis of tuberculosis."

Youmans,[24] on the other hand, has used depth-growth technics not for diagnosis but to study the culture cycle and growth rate of the tubercle bacillus. The growth curves so obtained showed either a lag phase, such as that obtained with other bacteria, or curves of direct growth not preceded by any lag. Such curves are especially valuable in that they afford the investigator a method for determining the degree of inhibition of various bacteriostatic substances. For example, by this technic it could be demonstrated that, in suitable concentrations, para-aminobenzoic acid could reverse the bacteriostatic action of 4,4,diaminodiphenylsulfone. On the other hand, para-aminosalicylic acid appeared to be highly bacteriostatic in vitro and at least moderately effective for the suppression of tuberculous infection in white mice.[25]

An interesting sidelight to the bacteriologic diagnosis of tuberculosis lies in the fact that false acid-fast organisms may be obtained from some wounds to which fats and greases, such as lanolin and petrolatum, have been applied. Saprophytic diphtheroids present in the wound may become coated with such fats, presenting an almost typical acid-fast appearance when stained by the usual methods and viewed under the microscope.[26] The nature of the acid-fast stain itself has been further elucidated by Lamanna,[27] who postulates that the basis for the acid-fast property lies in the greater solubility of the phenol and dye in the cell constituents than in the decolorizing agent.

Therapy

Antibiotics

Unlike other chemotherapeutic agents and antibiotics that have had their day of popularity and have quickly gone into discard, streptomycin continues to be a drug of promise in the treatment of tuberculosis. Although Corper and Cohn[28] believe that, on the basis of experiments in vitro and in vivo, there is no evidence that streptomycin enters the important organs in appreciable amounts for any significant time and that the drug is not tuberculocidal in reasonable amounts, they also believe that this antibiotic does retard the growth of actively multiplying tubercle bacilli: "In the usual case of clinical tuberculosis in man, the bacilli appear to reproduce and develop only at irregular periods undeterminable by clinical means and over long periods of time, and this markedly reduces the applicability of a retardant without tuberculocidal action for use in human tuberculosis." Although its application to human tuberculosis is therefore limited, streptomycin may indicate the selective tuberculocide through laboratory experiments.

Clinical reports, however, indicate that streptomycin is effective in the control of tuberculosis. Hinshaw and his colleagues,[29] in a study of 75 tuberculous patients, report that the drug has a "suppressive action" in man but add that long study will be required to determine its optimal dosage and the duration of treatment in various clinical situations. Of 10 patients with generalized hematogenous tuberculosis with or without meningitis, 4 (with meningitis) recovered after streptomycin therapy; clinical findings, however, indicated that the infection had persisted, and the long-term prognosis appeared uncertain. Of 24 patients with pulmonary tuberculosis — 14 far advanced, 8 moderately advanced and 2 minimal — 19 improved with sufficient promptness to make it appear probable that treatment with streptomycin was a significant factor. All of 6 patients with ulcerating lesions of the major respiratory passages responded rapidly to a com-

bination of streptomycin aerosolization and intramuscular injections. On the other hand, only 8 of 14 patients with urogenital tuberculosis gave a favorable response to treatment. In most cases the total daily dose varied from 1 to 3 gm.

Pfuetze et al.[30] also report a series of 30 cases of pulmonary tuberculosis in which streptomycin was administered from two to six months. With few exceptions the patients selected for antibiotic therapy had tuberculosis that was progressive or had not responded to rest in bed. Of these 30 cases, 20 were far and 8 moderately advanced, and in 2 the disease was minimal. On the basis of roentgenographic findings, there was marked improvement in 13 cases, moderate improvement in 7 and no change in 4. Within three to six months after the administration of streptomycin had been stopped there was some exacerbation of the disease in 7 cases, indicating that the action of streptomycin was merely suppressive, not tuberculocidal. In a case of tuberculous meningitis reported by Krafchick[31] complete clinical recovery was obtained with absolutely no residual neurologic abnormalities.

Some of the limitations of antibiotic therapy have recently been outlined by Hilleboe[32] as follows:

> It should be kept in mind that any antibiotic, even though effective against the tubercle bacillus, may be of little benefit to far-advanced cases, because irreversible processes have set in and, in most instances, the blood supply to areas of cavitation and other areas with extensive involvement has been cut off.

Too much help should not be expected from an antibiotic in such advanced cases, even though its action is most favorable in minimal disease.

Some other antibiotic, or a combination of an antibiotic and chemotherapy, may prove ultimately to be the actual solution of tuberculosis management. Marshak,[33] for example, has found that California Spanish moss (*Ramalina reticulata*) can be treated chemically to yield a crystalline substance that is nontoxic for guinea pigs and appears to retard the progress of the disease in experimental infections. The possibilities of this compound in human tuberculosis remain to be explored. Smith and his colleagues[34] have adduced experimental evidence that Promin and streptomycin have a synergism that enhances the antituberculosis action of each. The possible value of such a combination of drugs in human tuberculosis is also unknown at present.

Chemotherapy

A relatively new bacteriostatic agent, glycerite of hydrogen peroxide, has been described by Brown and Slanetz[35] as having tuberculostatic action in a weak dilution (0.1 per cent) and tuberculocidal action in a greater concentration (from 0.5 to 4.0 per cent). After local application in 4 cases to "cold abscesses" of the chest wall and other areas, complete healing was noted in 3 and improvement in 1. Since glycerol, itself, may inhibit the growth of tubercle bacilli,[21] however, and since cold abscesses occasionally heal spontaneously, controlled trials with this new bacteriostatic agent must be carried out before its role in the therapy of clinical tuberculosis can be ascertained.

The relation between chemical structure and tuberculostatic activity is of fundamental importance for the future development of more effective tuberculocides, but this relation is still not clearly understood. In vitro tests, however, by Youmans and Doub[36] on fifty-nine different sulfone compounds indicate that two para-oriented free amino groups are essential for maximum activity in the diaminodiphenylsulfone grouping. Thus, p,p,diaminodiphenylsulfone is most active compared to compounds in which a methyl group has been substituted for amino or in other compounds in which the amino radical has been transferred to the meta or ortho position. A new class of tuberculostatic substances, unrelated to the sulfones, has recently been described by Feinstone.[37] The parent compound is 5-amino-2-butoxypyridine, but the sodium formaldehyde bisulfite derivative is least toxic. Some strains of tubercle bacilli were inhibited in dilutions as high as 1:100,000,000. The most striking attribute of these compounds is that they appear to be specific for the acid-fast group of organisms and have little inhibitory action on other bacteria.

Immunization

In an earlier review attention was called to the increasing recognition being given to BCG (Bacillus Calmette Guérin) as a possible immunizing agent in selected persons.[38] This year, further evidence regarding its possible value has been presented. Obviously, patients who are already infected, indicated by a positive reaction to tuberculin, are not suitable candidates for BCG immunization.

The experience of the National Research Council of Canada with BCG immunization in hospitals and sanatoriums of Canada has recently been recorded by Ferguson.[39] Nurses entering training between 1934 and 1943 were accepted for this study, and in this group, there were 1005 vaccinated subjects, 759 who were initially Mantoux-negative and not vaccinated and 278 young women who were tuberculin positive. Of the vaccinated persons only 9 developed "manifest tuberculosis," — that is, either pulmonary tuberculosis demonstrable by x-ray study or nonpulmonary disease, — an incidence of 0.9 per cent. Of the tuberculin-negative, nonvaccinated nurses, 29, or 3.8 per cent, developed tuberculosis. And of those who were initially tuberculin positive, 3, or 1.1 per cent, had demonstrable disease. Ferguson therefore considered the use of BCG vaccination in the hospital environment to have reduced manifest tuberculosis among negative reactors by three fourths. Vaccination with BCG was regarded as a safe, practical, convenient and reasonably effective

method of controlling tuberculosis among young women in a tuberculous environment.

In Brazil, where the mortality rate from tuberculosis is about 250 per 100,000 population, the world's most extensive trials with BCG vaccination have been carried out. The Brazilians prefer to use an oral vaccine instead of an intracutaneous vaccine, such as that employed in Canada. More than 340,000 persons have thus been vaccinated, and the results, to date, are regarded as favorable. The details of the program are described by Bueno.[40]

The Danes have also found that BCG vaccination can be carried out safely and effectively. In Denmark all children who are Mantoux negative and all newborn infants in a tuberculous environment are vaccinated intracutaneously. On converting to a positive tuberculin reaction, these children and infants have been permitted to associate with the source of infection at home. In Denmark, therefore, BCG vaccination has been subjected to a severe test, and its general acceptance in that country has been based on truly critical appraisal. For example, Table 1, based on an article by Holm,[41] sums up some of the experience with BCG vaccination among college and medical students, who, respectively, are considered "especially exposed" and "not especially exposed" to tuberculosis. Both the hazard of placing a tuberculin-negative person in a tuberculous environment and the significant degree of protection afforded by BCG vaccination are demonstrated. The greatest incidence of infection was among the tuberculin-negative persons placed in a tuberculous environment. Although the numbers are too small for statistical conclusions the vaccinated persons appear to be the best protected against tuberculosis. Other evidence for this point of view is provided by the Danish experience on the island of Bornholm, where the number of new cases of tuberculosis in the group from fifteen to thirty-five years of age has been reduced by half since the introduction of BCG vaccination. Holm's conclusion is as follows:

> The vaccination gives considerable, but not absolute protection. It protects completely against the morbid phenomena accompanying the tuberculous primary infection and it also affords a considerable protection against genuine tuberculosis of the various organs — in particular, against phthisis.

Table 1. *Results of BCG Vaccination in Denmark.*

Group	Medical Students			Other University Students		
	Total No.	Positive X-ray findings only	X-ray sputum	Total No.	Positive X-ray findings only	Positive sputum
Mantoux positive	936	12	6	1135	5	4
Mantoux negative	322	38	17	541	14	4
BCG vaccinated	112	0	0	63	0	0

Miscellaneous Topics

Psychosomatics

With the renewal of interest in psychosomatics generally, a revival of interest in the psychosomatic factors in tuberculosis was inevitable. That this is actually a revival and not something new is pointed out by Friedman and his co-workers.[42] At the Bruns General Hospital they studied 100 male tuberculous patients, each of whom was given at least a one-hour interview by a neuropsychiatrist. Family data and personal and social histories were obtained and carefully tabulated and evaluated. On the basis of this and other information it was concluded that the patients with tuberculosis had many personality traits in common:

> These patients showed independence and efficiency which made them normally or better than normally adjusted in their economic, sexual and social spheres. They showed some resentment toward authority. They showed obsessive and compulsive characteristics and were optimistic individuals.

Since these data apply only to a limited group of persons — young men — conclusions regarding the personality make-up of other tuberculous patients are not warranted. The authors, however, make certain useful suggestions concerning how these traits may be directed toward purposeful and healthier channels.

Another interesting study, but one that I regard as carrying psychosomatics too far into the realm of infectious diseases, is presented by Hartz,[43] who tends to link the dyspnea following thoracoplasty to claustrophobia. The article is valuable in pointing out that psychic reassurance after a thoracoplasty — and perhaps after any major operation — may be as valuable as sedatives and narcotics. Even in tuberculosis one should always remember that the patient, not merely his lungs, needs treatment.

Pulmonary Lavage

Recent reports from Brazilian investigators indicate that pulmonary lavage as a means of recovering tubercle bacilli warrants further investigation. De Abreu[44] has performed such lavages in 150 cases and considers the technic both efficient and safe. Collection of the sputum is carried out in much the

same way as the pharynx is anesthetized for bronchography, and a cough reflex is then promoted. "Pulmonary lavage," says de Abreu, "is yet at the beginning of its application. It is a new method which needs long observation to determine definitely its harmlessness and efficiency." Bueno[45] believes that his technic, which is slightly different from de Abreu's, is easier to perform than gastric aspiration but that it should not be employed in a person who has a low vital capacity or is suffering from asthma.

Immobilization of Both Lungs

During the past few years Barach[46–49] has devised a pressure chamber in which a patient may be placed and allowed (perhaps "forced" would be a better word) to breathe while the chest is completely immobilized. In a recent paper the physiologic principles, the technic and the results of this method are reviewed.[49] Of a small group of patients, 2 showed no benefit, 3 had moderate or temporary benefit, and 5 had marked benefit or clinical recovery. Although Barach appreciates the difficulty in evaluating any new therapy for pulmonary tuberculosis, his observation is as follows:

> The provision of local lung rest by residence in the immobilizing pressure chamber promotes the process of healing and closure of cavity in some cases of advanced and moderately advanced pulmonary tuberculosis. This favorable response has been observed in cases for whom no other form of treatment was possible or who had been exposed to other types of tuberculosis therapy without benefit.

Ambulatory Pneumothorax

It is perhaps not widely enough realized that ambulatory pneumothorax may be used as a valuable adjunct to other measures for the control of pulmonary tuberculosis. Rest[50] comments on the futility of trying to admit every tuberculous patient into a sanatorium, since there are only 90,000 beds to accommodate the 500,000 known active cases in the United States. If for some reason, a patient cannot or will not be admitted to a sanatorium, ambulatory pneumothorax may be indicated. Good results are reported in a small number of patients who were given this form of therapy, but Rest cautions, "Delay in administering therapy while the patient is still in the treatable stage may alter the prognosis to an unfavorable one and result in years of prolonged sanatorium care for the patient." Tice[10] has reviewed the Chicago experience with ambulatory collapse therapy and has outlined its growth since 1931. He points out that with ambulatory pneumothorax 76 per cent of the patients treated were living, as compared with 39 per cent of the controls. As of January 1, 1945, there were 1600 patients under therapy, 150 under observation for collapse, and 50 under post-treatment supervision. In China, where hospital facilities are woefully inadequate and living conditions wretched, Wright[51] also commented that, although ambulatory pneumothorax was not an ideal form of treatment, there was obviously a great need for the method under such conditions.

Bronchography

Further recognition should be given to the fact that bronchography, which is widely used in the diagnosis of bronchiectasis, may be carried out with safety in tuberculosis. Boyer[52] points out that whereas bronchography should not be used as a routine procedure in tuberculous patients, it is often of value in revealing the source of positive sputum. This is particularly true in cases in which thickened pleura, empyema and thoracoplasty obscure the pulmonary pattern. Reference should also be made to the exhaustive investigations by Dormer and his colleagues[53] on this subject.

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CASE RECORDS OF THE MASSACHUSETTS GENERAL HOSPITAL

Weekly Clinicopathological Exercises

FOUNDED BY RICHARD C. CABOT

TRACY B. MALLORY, M.D., *Editor*

BENJAMIN CASTLEMAN, M.D., *Associate Editor*

EDITH E. PARRIS, *Assistant Editor*

CASE 33271

PRESENTATION OF CASE

A sixty-one-year-old mechanic entered the hospital because of epigastric pain.

He had apparently been in good health until seven years before entry (two months before the death of his wife), when he began to have episodes of pain in the right and middle epigastric region. He was treated conservatively for several months at a clinic and then sent home with instructions to rest, to stop smoking and to drink milk whenever he had pain. He remained asymptomatic for six months, but when he returned to work and started to smoke again the pain recurred. During the six years before entry he had pain almost daily. It was not entirely relieved by food and was usually worse about two hours after eating. Amphojel and milk were of some benefit. For six months before entry the patient had had gaseous eructations, nausea and occasional vomiting, as well as increased epigastric pain. He also complained of severe spontaneous epistaxes, which had occurred during the eight months before entry. There had been no hematemeses or changes in bowel movements. The patient believed that he had recently lost weight but did not know how much. He denied drinking alcohol but admitted smoking twelve to fifteen cigarettes a day.

Physical examination disclosed a well nourished patient in no distress. The heart and lungs were clear. The abdomen was tense, with a sense of resistance in the epigastrium and right upper quadrant. The liver edge was percussed two finger-breadths below the costal margin in the midaxillary line. There was no abdominal tenderness.

The temperature, pulse and respirations were normal. The blood pressure was 148 systolic, 90 diastolic.

Examination of the blood revealed a red-cell count of 5,500,000, with 18 gm. of hemoglobin, and a white-cell count of 7300, with 68 per cent neutrophils. The urine was normal. A stool was soft, yellow and guaiac negative. The total protein was 7.0 gm., and the nonprotein nitrogen 28 mg. per 100 cc., and the chloride 104 milliequiv. per liter. The prothrombin time was normal. A blood Hinton test was negative.

A gastric analysis revealed 40 cc. of pinkish, mucoid material with no free hydrochloric acid before the administration of histamine. Thirty minutes after histamine had been given 30 cc. of similar fluid contained 30 units of free hydrochloric acid. A gastrointestinal series revealed an ulcer crater, 2 cm. in breadth and 1 cm. in depth, lying along the lesser curvature high in the fundus just below the esophageal orifice. No definite tumor mass was seen about the ulcer. Barium

passed the pylorus without hesitancy, filling a duodenal bulb to normal contour. On the seventh hospital day gastroscopy revealed a reddish, hyperemic area high in the lesser curvature. This area seemed to extend into the fundus but could not be completely visualized. Elsewhere the gastric mucosa appeared normal. No ulcer was seen.

A smear of gastric juice was reported "negative" for malignant cells. The patient continued to have pain two to four times in twenty-four hours, usually at night. At times the pain lasted throughout the day and failed to respond to milk and Gelucil. Another gastrointestinal series during the third week showed no change in the size of the ulcer (Fig. 1).

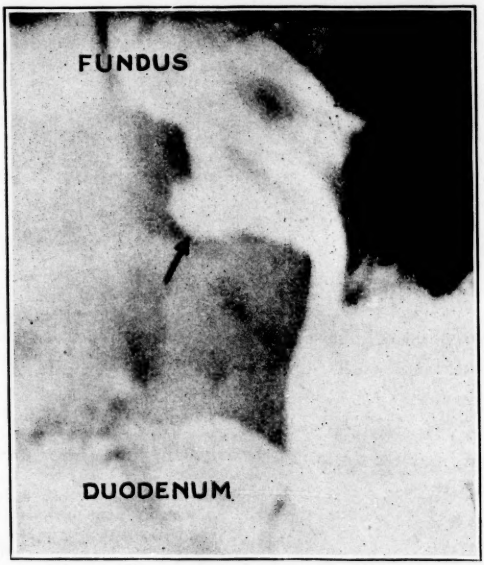

FIGURE 1. *Roentgenogram showing Gastric Ulceration and Surrounding Mass.*

On the twenty-seventh hospital day an operation was performed.

DIFFERENTIAL DIAGNOSIS

DR. WADE VOLWILER: This case presents the problem of the differential diagnosis between benign and malignant peptic ulcer, located high on the lesser curvature of the stomach immediately below the esophageal entrance. The duration of the symptoms, all of which supposedly occurred from this particular lesion, was seven years, which seems somewhat long for a neoplasm. It is implied by the history that the onset of difficulties occurred at a time of great psychic stress. The therapeutic regimen prior to hospital entry was apparently poor. It has been my experience that a patient with a peptic ulcer often receives instructions or advice from his physician to take between-meal antacids or food only at times when pain is present. A proper program is obviously one that prevents such pain from occurring by regularly scheduling the medication and food by the clock. After a brief remission the pain syndrome in this case returned when the patient returned to work and to smoking. It is entirely possible that tobacco was an important factor in the persistence of this lesion if it proved benign.

I am impressed by the statement that the pain was not relieved by a proper ulcer regimen even after several weeks in the hospital. This fact above all others suggests an infiltrating carcinoma. The gastric analysis in the hospital is of no help in clinical diagnosis.

I should like to know if an x-ray examination of the stomach was carried out at the clinic mentioned

in the record. If so, is it fair for me to have the information?

DR. BENJAMIN CASTLEMAN: If x-ray examination had been performed, I am sure that the results would have been incorporated in the abstract.

DR. VOLWILER: Do we have the x-ray films taken here?

DR. RICHARD SCHATZKI: The report given in the record may be misleading. Usually, the report in the officially prepared record is a statement of fact. Here a conclusion has been drawn. A large crater can be seen on the lesser curvature near the cardia of the stomach extending to the posterior wall. That is referred to in the report as a filling defect around the crater. The question is, Is it a tumor or inflammatory induration around a benign ulcer? Do you want me to give my own opinion? I do not know the case.

DR. VOLWILER: Why not give it when I have finished? How far below the entrance of the esophagus do you think this lesion is?

DR. SCHATZKI: I cannot see the actual cardia, but I should say that it was fairly close to it — within a few centimeters.

DR. VOLWILER: The inner contour of the crater is rather smooth?

DR. SCHATZKI: Yes.

DR. VOLWILER: This gastroscopic description leaves something to be desired. The site of an ulcer often cannot be visualized by the gastroscopist. But I should like to know whether peristalsis was active in the hyperemic area described and whether that particular portion of the gastric wall appeared rigid to air insufflation.

DR. CASTLEMAN: The only additional statement in the gastroscopist's report is that there was no evidence of infiltration.

DR. VOLWILER: I assume that that means that there was no obvious rigidity.

The Vincent Laboratory here has had a 20 per cent error in diagnosis from examination of fifty gastric-juice samples for malignant cells. An appreciable part of the error is believed to be due to the fact that the specimens are too old and are delivered more than an hour after being drawn from the patient. Better co-operation on our part may improve these statistics. Until the accuracy is considerably higher, this type of examination will not be useful clinically.

I assume that this man was operated on because of two facts that seriously raise the question of cancer: pain continued in spite of good management and was often not relieved by food or antacid, and x-ray study showed little reduction in the ulcer crater during the three weeks' hospital care.

DR. SCHATZKI: I did not realize that these films were taken on different dates. There is little change in the size of the ulcer, however.

DR. VOLWILER: Because of the anatomic location of the lesion, I believe that a transthoracic subtotal gastrectomy was the operation performed. I believe that such an operation in a sixty-one-year-old man in this hospital carries at least a 10 to 15 per cent mortality risk. Is that a fair statement, Dr. Welch?

DR. CLAUDE E. WELCH: It is too high, the mortality for subtotal transthoracic resections being 4 per cent. The percentage for total transthoracic resections for cancer is higher — around 30 per cent.

DR. VOLWILER: I had not realized that the percentage was so low. Therefore, one needs only to believe that the likelihood of cancer in this patient was greater than 4 per cent if that type of operation was considered to be a proper move. My choice between these two diagnoses can be little more than a guess. I believe, however, that the facts indicate that this was probably an infiltrating carcinoma.

DR. CASTLEMAN: What is your opinion, Dr. Schatzki?

DR. SCHATZKI: Roentgenologically, the lesion appears to be benign. I cannot tell what the microscope will show.

DR. CASTLEMAN: The report of Dr. Milford D. Schulz was as follows: "The findings are those of gastric ulcer, grossly benign."

DR. WELCH: I wonder if Dr. Volwiler could explain the pain on the basis of the fact that the ulcer had perforated and therefore that carcinoma was not necessarily the cause. I do not argue about the treatment.

DR. WALTER BAUER: That was my thought, also.

DR. VOLWILER: That is a reasonable explanation.

CLINICAL DIAGNOSIS

Gastric ulcer, benign.

DR. VOLWILER'S DIAGNOSIS

Carcinoma of stomach.

ANATOMICAL DIAGNOSIS

Benign peptic ulcer.

PATHOLOGICAL DISCUSSION

DR. CASTLEMAN: This patient was operated on through the chest by Dr. Carroll Miller. He did a subtotal gastrectomy and found, 4 cm. from the esophageal orifice on the lesser curvature, a large ulcer that had eroded into the pancreas. On gross examination the ulcer looked benign, although it was surrounded by a good deal of inflammatory reaction. Microscopically, sections confirmed the benign character of the lesion. It was an active ulcer, with a red-staining, fibrinoid base similar to that seen in active peptic ulcers.

DR. VOLWILER: Do we know anything about the incidence of recurrence of benign peptic ulcer with that sort of anastomosis? The top part of the stomach is removed, and the major acid-bearing portion and antrum are left in.

DR. WELCH: That is an interesting question, but we do not know anything about it yet. The antral mucosa remains, and there may be an increased tendency toward recurrence.

DR. CASTLEMAN: Still, you would not want to advise total gastrectomy at the first operation?

DR. WELCH: No.

DR. SCHATZKI: Have there been recurrences in cases in which that procedure has been done?

DR. WELCH: No recurrences have been observed to date, although the number of patients is small and the time interval short.

CASE 33272

PRESENTATION OF CASE

An eighteen-month-old boy entered the hospital because of edema of the face and lower extremities.

The child had been perfectly well until about three months before admission, when the first signs of an illness characterized by restlessness, irritability and a low-grade fever had developed. He slept and ate poorly and ran a continuous fever, the temperature never exceeding 101°F. After a few days, periorbital swelling appeared. The administration of tincture of digitalis for three days was sufficient to cause the edema to subside, but it recurred ten days after the drug had been withdrawn. Another course of digitalis was followed by a long remission during which the patient was kept inactive in bed. He occasionally refused a meal, but ate well at other times and did not appear ill. During this interval a heart murmur was heard for the first time. About three weeks before entry the child had suffered a brief attack of sore throat. Two weeks later he again appeared ill, with rapid panting respiration and slight cyanosis. On the day preceding admission edema of the lower extremities began to develop.

Birth had occurred at term after a normal gestation period. No complications accompanied the delivery or the neonatal period. The birth weight was 6 pounds, 11½ ounces. Mental and physical development proceeded normally until the present illness. The heart sounds were said to have been normal a year before the present illness. There were no siblings, and no familial diseases were reported.

Physical examination disclosed a child lying flat in bed and breathing rapidly at a rate of 36 per minute. The skin was dusky and cyanotic; the neck veins pulsated in the sitting position. Slight pitting edema extended over the ankles and lower portions of the legs. The chest was asymmetrical, bulging over the precordium. The heart was greatly enlarged to both the left and the right. The sounds had a pounding quality. The rhythm was regular. A loud, rather harsh systolic murmur audible all over the precordium radiated to the axilla and was heard posteriorly on both sides. A rolling mid-diastolic murmur was heard best beneath the nipple and in the axilla. Both lung fields were clear. The liver edge extended 6 cm. below the rib margin. No clubbing of the fingers was noted. Femoral pulsations were present. The patient weighed 20 pounds and was 30 inches tall.

The temperature was 98°F., the pulse 106, and the respirations 150. The blood pressure was 90 systolic, 60 diastolic.

Examination of the blood revealed a red-cell count of 4,650,000, with a hemoglobin of 10.9 gm., and a white-cell count of 19,200 that subsequently fell gradually to 8700. The urine gave a + to ++ test for albumin, and the sediment contained 0 to 4 red cells and 4 or 5 white cells per high-power field. In several 7-foot films of the chest, the heart shadow was greatly enlarged, the transverse diameter being 12.5 cm. compared to an internal thoracic diameter of 15.5 cm.; the contours were smoothly ovoid. No calcification was visible within the heart area. On fluoroscopy the pulsations were normal. The ribs were horizontal, and in addition, on the right side there was an anomaly of the fourth, fifth and sixth ribs. The lower-lung fields were almost completely obscured except at the bases laterally, where they were clear. The upper-lung fields were hazy. The pulmonary vascular markings were accentuated. No transposition of the great vessels could be detected. An electrocardiogram demonstrated sino-auricular tachycardia, and low T waves in Leads 1, 2 and 3, but the axis and PR interval were normal.

Treatment consisted of digitalis and restriction of fluids. A maintenance dose of 20 mg. of digitalis daily sufficed to control the cardiac failure. By the tenth hospital day, the patient's general appearance was good. He was no longer dyspneic, and the edema had absorbed. Repetition of the chest films failed to demonstrate any marked change in the heart size. Another electrocardiogram recorded a drop in the rate to 100 per minute and a rise in the voltage of the T waves.

On the tenth day, mild coryza developed without fever. It lasted three days and then cleared spontaneously. A throat culture grew out a few colonies of Type 17 pneumococci, but subsequent ones were negative. Four blood samples were cultured in the course of a week. One was sterile in both flasks; nonhemolytic streptococci, *Staphylococcus aureus* and diphtheroids, respectively, were recovered from one flask in each of the other three cultures. The erythrocyte sedimentation rate (Westergren) at the end of the bout of coryza was 2 mm. per hour, and on the twenty-fifth day it reached 16.5 mm. per hour. The child was discharged home in the care of his physician on the twenty-sixth day.

About a year after discharge, the physician reported that the patient was playing fairly actively without dyspnea or edema. He was taking 50 mg. of digitalis six days a week. No clubbing of the

fingers had developed. The liver was palpable but nontender and not definitely enlarged. The heart remained extremely large.

At the age of three and a half years the patient weighed 31 pounds and was slightly over 38 inches tall. His condition was still fair, but a thrill had developed over the xiphoid process.

At the age of four he developed pneumonia, which cleared rapidly with penicillin, but from then on he had a bothersome cough and began to be decompensated. Edema first appeared in the extremities and then spread upward. Two months after the occurrence of the pneumonia, edema, ascites and dyspnea were severe. The patient died soon afterward.

Differential Diagnosis

Dr. Ralph A. Ross: This case of recurrent cardiac decompensation started at the age of fifteen months and progressed, with remissions and recurrences, for nearly three years. The patient had been well up to the onset of the illness. He responded well to digitalis until the agonal period. The fact that physical development, which was said to have been normal for an eighteen-month-old infant, was at the lower limits for the age group may or may not be of significance. At the age of three and a half years the patient was well within the normal limits, so that if he was below par at admission to the hospital he made up for slow growth before he died.

On physical examination there were the classic signs of decompensation, — dyspnea, cyanosis, increased venous pressure, pulmonary congestion, hepatomegaly and edema, — as well as periorbital edema, which is unusual. The progressive signs of valvular damage are clear from the record, starting with a precordial systolic murmur before the first admission and then a definite mid-diastolic murmur over the mitral area; finally, a thrill developed before death.

The x-ray films showed general cardiac enlargement. May we see them? There were good pulsations on fluoroscopic examination, which seem to rule out a large collection of fluid.

Dr. Toufic Kalil: These are the rib anomalies. The heart is enlarged in all diameters, and the carina is widened behind the heart. The left main bronchus is raised considerably, which indicates some degree of enlargement of the left auricle, as well as of the ventricles.

Dr. Ross: The electrocardiograms are not particularly helpful, indicating on the second tracing that some benefit, which could be determined from the clinical picture, had occurred. There was at no time any indication of polycythemia. There was a transient leukocytosis at the onset of the hospital stay. The urinary findings are probably explained best on the basis of cardiac decompensation. Certainly, the onset of periorbital edema, the acute decompensation, the enlargement of the heart and the response to digitalis can be explained by myocarditis associated with glomerulonephritis, but the lack of further urinary findings and the subsequent course of the disease are against that diagnosis. There are other, more esoteric conditions that should be considered — von Gierke's disease, the glycogen-storage abnormality that occurs sometimes predominantly in the heart without much involvement of the rest of the body, clinically seems unlikely in a child who lived for four and a half years and grew relatively normally. We have no indication that there was any acetone in the urine or that the adrenalin test was done. I think that that diagnosis is unlikely. Interstitial myocarditis, described by Fiedler,[1] is a possibility if there is no other explanation for the enlarged heart. I simply bring it up as a thought. I do not know how we can go farther than that with it. Recently, at the Children's Hospital a case was diagnosed pathologically in a patient who had lived for a year without obvious cardiac symptoms, entered the hospital with what were thought to be pulmonary symptoms and died with a diagnosis of interstitial myocarditis as the only cause for the symptoms.

In favor of congenital heart disease is the presence of other anomalies, particularly those of the ribs. Congenital anomalies tend to be multiple. The bulging of the thorax noted three months after the onset of symptoms could have been due to acquired heart disease in a child of that age. How can we explain the progressive signs on the basis of congenital heart disease? The patient could have had bacterial endocarditis. The blood cultures in the hospital were negative. The long course after admission makes a diagnosis of subacute bacterial endocarditis untenable. An acute terminal bacterial endocarditis may, of course, have developed after the pneumonia. This leads me to the final possibility — acquired rheumatic heart disease. So far as rheumatic fever is concerned, no family history was noted, and the child was quite young; the disease, however, is occasionally seen at this age. The febrile episode before the onset of cardiac symptoms, the exacerbation two weeks after the respiratory infection, the failure of an exacerbation after pharyngitis apparently due to pneumococcus, the adequate growth of the child and the progressive development of murmurs seem to me to support the diagnosis of acquired rheumatic heart disease. Against this diagnosis is the response to digitalis. Usually, in children, cardiac decompensation associated with rheumatic heart disease is on the basis of active infection, and digitalis rarely works so effectively as it apparently did in this case. The normal sedimentation rate can be disregarded because the child was probably in some degree of cardiac failure. Thus, I am left with the diagnosis of rheumatic heart disease and myocarditis, with mitral stenosis.

Dr. Gertrud C. Reyersbach: We were as puzzled as Dr. Ross, and he has mentioned the

points that made us doubt whether the child had rheumatic fever. We finally decided on rheumatic fever as a working diagnosis, but we were never quite convinced. The subsequent course does not bear it out. The child never had episodes of rheumatic fever according to what happened later. He developed a thrill over the xiphoid area, which is not consistent with mitral stenosis.

DR. PAUL D. WHITE: I think that the murmurs observed in the hospital can be explained on the basis of enlargement of the heart alone without valvular disease necessarily. Frequently, during the early stages of rheumatic heart disease, perhaps in the first few years of a history of rheumatic fever, even mitral diastolic murmurs can be explained wholly by dilatation of the heart, without valvular deformity. Just what the thrill meant I do not know, but I do not recall that I found a thrill when I examined this patient at the time of admission. I should want to feel such a thrill before committing myself. It does look as if an infectious process were more probable than a congenital defect, because there had been fever and leukocytosis and no clear-cut characteristics of congenital anomalies — there was no clubbing of the fingers, for example. The cyanosis noted at first cleared up. It was not a constant cyanosis?

DR. REYERSBACH: No.

DR. WHITE: The electrocardiogram was normal, which is important from the standpoint of many congenital defects of the heart in which it would be abnormal. It could be normal in various infections, as for example acute rheumatic fever, despite the age, and that is to my mind the likeliest. Years ago I looked up the cardiac cases of infants, less than two years of age, with acute endocarditis at the Infants' Hospital in Boston, and as I recall there were a number of cases of bacterial infection but I do not remember finding any cases of rheumatic valvular involvement or rheumatic heart disease. Certainly, the diagnosis of pericarditis alone is not acceptable. Digitalis may help congestive failure in the presence of active rheumatic fever if the patient is treated at a favorable time — when the active infection has begun to subside.

CLINICAL DIAGNOSIS

Rheumatic heart disease, with mitral insufficiency.

DR. ROSS'S DIAGNOSES

Rheumatic fever.

Rheumatic heart disease, with mitral involvement.

ANATOMICAL DIAGNOSES

Healed endocarditis, type undetermined, of mitral and tricuspid valves and ventricular endocardium.

Hypertrophy of heart.

PATHOLOGICAL DISCUSSION

DR. TRACY B. MALLORY: When a case is dubious on clinical grounds it often remains dubious on anatomic grounds. I was puzzled by this case too. The flaps of the mitral valve were thickened and interadherent, and the chordae were shortened. There was a similar, although slighter, change in the tricuspid valve. The aortic and pulmonary valves were perfectly normal. Besides these valvular changes there were two unusual features. One was hypertrophy. The heart was four times the normal size for a child of this age. The hypertrophy was rather generalized in all chambers. There was also a marked degree of thickening in the ventricular endocardium. This appeared in patches in all four chambers and was almost diffuse in the left ventricle. We have a considerable number of sections from the heart, and microscopically they all show extreme thickening of the endocardium extending along the thebesian vessels into the myocardium but otherwise no trace of myocardial scarring; nowhere in the heart could we find anything that suggested an active rheumatic lesion. Sections of the valve showed simply a marked thickening of the connective tissue and some mucinous degeneration, but no inflammatory infiltration whatsoever; this does not suggest the picture of rheumatic endocarditis.

I am reminded of the case of another child that we had at these conferences a number of years ago, in which the clinical picture had been one of uncontrollable tachycardia of many months' duration.[2] In that case the valves were negative, but there was the same thickening of the endocardium that this child showed. It was even more marked than in the case under discussion. It is rather flying in the face of Providence, when there is mitral stenosis and tricuspid involvement, to say that this was not rheumatic endocarditis, and yet I have genuine doubt that it was. If it was not rheumatic endocarditis, I do not know what it was.

DR. WHITE: Could bacterial endocarditis have produced this picture?

DR. MALLORY: I do not see how it could have. Endocardial fibrosis was marked and a characteristic feature of the whole process in the heart. I should not expect that with bacterial endocarditis, which is sharply limited to the leaflets or endocardium close to the valves. I should also not expect it to be spread diffusely on the ventricular endocardium.

DR. WHITE: Has Dr. Bland any suggestions?

DR. EDWARD F. BLAND: I have never seen anything like the patient that Dr. Mallory has referred to, who died of a cerebral embolism. There was no embolus involved in the case under discussion. It does not sound like rheumatic heart disease clinically.

DR. MALLORY: We have seen few children die of rheumatic heart disease in the absence of active rheumatic infection.

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The New England
Journal of Medicine
Formerly
The Boston Medical and Surgical Journal
Established 1828

Owned by the Massachusetts Medical Society and Published under the Jurisdiction of the Committee on Publications

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Material should be received not later than noon on Thursday, three weeks before date of publication.

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A SUBACUTE AND MALIGNANT FORM OF EPIDEMIC HEPATITIS

Infectious hepatitis and homologous serum jaundice are generally regarded as relatively mild diseases that are associated with a low mortality rate — about 0.2 per cent. Recovery is usually complete. Cases do occur, however, in which these infections are followed by a long-standing disability with a variety of symptoms referable to the liver or nervous system, or both.[1–5]

Lucké[6] described the pathological findings in the livers of 14 cases observed in the Army after apparent recovery from epidemic hepatitis. The livers had become available for examination as a result of fatal accidents or unrelated diseases from one to fourteen months after the attack of hepatitis. From the study of these livers, Lucké concluded that complete restoration of the hepatic parenchyma usually occurs in nonfatal cases of hepatitis. Regeneration is usually complete provided that the destruction is acute and the injury is not continued and provided also that the destructive changes involve only the hepatic cells and not the framework or vessels; all this generally holds true in epidemic hepatitis. Lucké could find no evidence of permanent damage to the hepatic parenchyma.

Variants from the usual form of hepatitis have been observed in the recent pandemic of hepatitis. Attention has been called in these columns to the fulminant type described by Lucké and Mallory,[7] in which death from acute hepatitis occurred within a period of less than ten days after the onset of symptoms. In Denmark another malignant form of hepatitis has been observed in recent years. In the cases that were observed there, death occurred several months after the onset of acute hepatitis. Reports of cases of this type are now available from hospitals in Copenhagen. One by Jersild appears elsewhere in this issue of the *Journal*, and another by Alsted[8] has recently been published. The malignant hepatitis observed in Denmark has occurred predominantly in women over forty-five years of age and has a fatality rate of about 50 per cent. The duration of illness is usually from four to nine months, but both more acute and more protracted cases have been observed. Clinically the cases are characterized by jaundice, recurrent attacks of pain associated with fever and evidence of portal obstruction — that is, edema and ascites. There is persistent evidence of impaired liver function. The pathological findings are largely limited to the liver, in which there is widespread destruction of liver tissue and, in the relatively chronic cases, replacement by connective tissue.

The etiology of this form of hepatitis remains obscure. On epidemiologic grounds it is believed that this type has a different cause than that of the usual cases of epidemic hepatitis and that it is different from homologous serum jaundice. Indeed, the possibility is considered that it may not even be an infectious disease, although no alternative causes have been suggested. Similarly, no effective therapy

has been found other than the usual dietary and supportive regimes that are used in cases of hepatitis.

The possibility that some special dietary or hormonal factors have altered the course of epidemic hepatitis in Denmark has been considered, but no evidence to support such a hypothesis has been offered. Interestingly enough, reports of similar cases from other European countries have not yet appeared, although it is possible that they have been encountered. Likewise, no such cases have as yet been recorded in large numbers in this country.

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DE SENECTUTE

THE lines "Gather ye rosebuds while ye may" and so forth, familiar to all of us, are still appropriate in these days of longer life but of accelerated living. They are, moreover, by one who knew his old age, Robert Herrick having put eighty-two summers behind him even in the seventeenth century, when the average span of man's life was well under forty years.

Not only has the duration of life nearly doubled since the over-ripe Herrick wrote his somewhat amorous lyrics; as a result, the average age of the populations of civilized countries has likewise steadily increased. The old, like the poor, will definitely be with us, and we must look to the better care of the aging, if they are to enjoy the fullness of their years. We must put more emphasis on the last of Shakespeare's seven periods of existence if we are to try and save the "lean and slipper'd pantaloon" from

> **. . . second childishness, and mere oblivion,**
> **Sans teeth, sans eyes, sans taste, sans everything.**

This interest in the problems of the old is fortunately quickening, here and abroad, to the point where geriatrics, caring for the tapering end of the life line, has become as serious a specialty as has pediatrics for its beginning. It is wise to bear in mind that the sunset of man's life may have as vivid colors as its dawn, and he is much more conscious of it.

As Dr. Roger I. Lee* has pointed out, we have, by our care of the young, permitted many more people to become elderly without doing much to make that increase in years any happier or even more endurable. One of our tasks is to make these added years, for which most of us hope and which most of us dread, more pleasant ones to anticipate and to attain.

The declining years of life should have their own activities and their own compensations and their own type of oversight. They require certain dietary limitations, as of fats and roughage, and certain dietary reinforcements, as of vitamins and even digestants. Indeed, some of the proprietary firms are already promoting pap for the aged as well as pap for the young.

Age has its dignity, too often lost; let it also have its comfort, too often lacking. Let our second childhood at least share the consideration given our first. The enthusiastic lines of Rabbi Ben Ezra,

> **Grow old along with me!**
> **The best is yet to be,**
> **The last of life, for which the first is made,**

particularly appropriate for a geriatric slogan, hold a promise that is still not always fulfilled but offers a target at which to shoot.

*Lee, R. I. Geriatrics: medical care of elderly. *New Eng. J. Med.* **230**: 190-193, 1944.

MASSACHUSETTS MEDICAL SOCIETY

A. M. A. ANALYSIS OF POSTWAR QUESTIONNAIRE

Discharged medical officers, according to an authorization from the American Medical Association, are entitled to one copy each of the "Analysis of the Postwar Questionnaire," which may be obtained from Frank G. Dickinson, Director, Bureau of Medical Economic Research, American Medical Association, 535 North Dearborn Street, Chicago 10.

This questionnaire was sent in November and December, 1946, to the 50,681 medical officers who were discharged prior to December 31, and sought opinions on the handling of medical matters during the war, with suggestions for improvement. Usable questionnaires returned totaled 26,018.

JOSEPH GARLAND, *Secretary*

BUREAU OF CLINICAL INFORMATION

All secretaries of various medical groups, such as special societies and alumni associations, are requested to notify the Bureau of Clinical Information regarding scheduled meetings, annual dinners and so forth. If such data are on file, it is hoped that duplication of dates can be avoided.

MASSACHUSETTS DEPARTMENT OF PUBLIC HEALTH

DISTRIBUTION OF TOXIN-ANTITOXIN DISCONTINUED

The Public Health Council of the Commonwealth of Massachusetts voted on May 13 to discontinue the distribution of toxin-antitoxin mixture on June 30. This action is in accord with the recommendations of the National Institute of Health and of authorities on diphtheria immunization who have for some time past been unanimous in the opinion that toxin-antitoxin mixtures should be entirely replaced by diphtheria toxoid for diphtheria immunization.

For the information of those who have not before used diphtheria toxoid in immunizing adolescents and adults, the following points should be emphasized.

Recommendations

All children between six months and high-school age should be immunized with diphtheria toxoid. The Schick test need not be performed on them before immunization, since the majority of children of this age group are susceptible to diphtheria.

The Schick test should be performed on all persons of high-school age or over who are exposed to diphtheria or who are likely to come in contact with it. Interpretation of the test indicates subsequent procedure as follows:

(*a*) Schick positive, control negative: susceptible. Administer diphtheria toxoid, with precautions as described below.

(*b*) Schick positive, control positive but smaller: immunity status uncertain. Such subjects are sensitive to the proteins of the diphtheria bacillus and may exhibit marked reactions to toxoid. Since they are few in number, they may be re-Schicked two weeks later, this test being read at seven days. A negative test indicates that the subject possesses latent immunity awakened by the first test, and therefore need not be immunized. If the test is positive, administer diphtheria toxoid with caution in small divided doses (see below).

(*c*) Schick and control show approximately equal reactions: immune but sensitive to diphtheria-bacillus proteins ("pseudoreaction"). No immunization indicated.

(*d*) Schick negative, control negative: immune. No immunization indicated.

Dosage

For children, three doses of 0.5, 1.0 and 1.0 cc. respectively, given at intervals of three or four weeks, are advised. Fewer doses or administration at shorter intervals may fail to produce immunity. Injections should be made subcutaneously after preparing the skin at the site of injection with tincture of iodine and alcohol. *Do not inject more than 1.0 cc.* Discard remaining contents of used vials at end of clinic session.

The standard dosage schedule given above may cause moderate or occasional marked reactions in older children and adults. For this reason the first dose in such patients should be 0.1 cc. If no marked reaction follows, subsequent doses should be 0.5, 1.0 and 1.0 cc. respectively. If a marked reaction occurs, the dosage can be adjusted in accordance with the severity of the reaction, and the interval between doses shortened, provided a total of 2.5 cc. is administered.

Precautions

Local and even general reactions are exceptional in younger children; older children and adults are more liable to have severe local and general reactions, so that toxoid should be given them only as described above. The reactions consist of varying degrees of redness, induration and swelling at the site of injection, sometimes accompanied by malaise, fever and headache, which usually clear up within two days.

Duration of Immunity: Reimmunization

Immunity of the level indicated by a negative Schick test develops in 90 to 95 per cent of children within three months after the administration of the last dose of diphtheria toxoid, and may be expected to persist for at least several years. Follow-up Schick tests six months after immunization will detect those who fail to respond to one immunizing course. Such persons should be given another series of inoculations.

It is recommended that children entering school who were immunized in infancy be given a stimulating dose of not over 0.5 cc. of toxoid This is of particular importance in communities where the low incidence of diphtheria makes it advisable to compensate for the consequent lack of latent immunization.

COMMUNICABLE DISEASES IN MASSACHUSETTS FOR MAY, 1947

RÉSUMÉ

Diseases	May 1947	May 1946	Seven-Year Median
Chancroid	0	4	3*
Chicken pox	2598	2248	1276
Diphtheria	38	21	14
Dog bite	1253	1421	1335
Dysentery, bacillary	5	5	12
German measles	107	1469	640
Gonorrhea	273	340	340
Granuloma inguinale	0	0	0*
Lymphogranuloma venereum	0	0	3*
Malaria	10	69	12
Measles	1783	11494	4208
Meningitis, meningococcal	3	7	16
Meningitis, Pfeiffer-bacillus	8	2	2
Meningitis, pneumococcal	1	4	6†
Meningitis, staphylococcal	0	0	0†
Meningitis, streptococcal	0	1	2†
Meningitis, other forms	3	1	1†
Meningitis, undetermined	7	3	3†
Mumps	1095	922	1459
Pneumonia, lobar	172	117	232
Poliomyelitis	0	1	1
Salmonellosis	14	3	6
Scarlet fever	440	851	1120
Syphilis	279	439	439
Tuberculosis, pulmonary	256	342	306
Tuberculosis, other forms	26	25	23
Typhoid fever	1	2	2
Undulant fever	8	6	6
Whooping cough	495	573	670

*Three-year median.
†Five-year median.

COMMENT

The diseases above the seven-year median are chicken pox, diphtheria, Pfeiffer-bacillus meningitis, salmonellosis and undulant fever.

Although below the prevalence for April, diphtheria was still above the level in May, 1946, and the seven-year median. The decrease was probably largely due to the usual seasonal decline.

The increase in salmonellosis is not explained by an outbreak; since more than one case was reported from only three communities, and all those reported only two cases.

The diseases below the seven-year median are bacillary dysentery, german measles, measles, meningococcal meningitis, mumps, poliomyelitis, scarlet fever and whooping cough.

This is the second consecutive month in which no cases of poliomyelitis were reported.

GEOGRAPHICAL DISTRIBUTION OF CERTAIN DISEASES

Diphtheria was reported from: Boston, 13; Brookline, 1; Chelsea, 10; Easthampton, 2; Everett, 1; Framingham, 1; Hinsdale, 1; Lynn, 1; Marion, 3; Medford, 1; Revere, 1; Somerville, 1; Wakefield, 1; Worcester, 1; total, 38.

Dysentery, amebic, was reported from: Lawrence, 1; total, 1.

Dysentery, bacillary, was reported from: Worcester (State Hospital), 5; total, 5.

Encephalitis, infectious, was reported from: Taunton, 1; total, 1.

Malaria was reported from: Berkley, 1; Boston, 2; Haverhill, 1; Lynn, 1; Middleton, 1; Springfield, 1; Taunton, 1; Winchendon, 1; Worcester, 1; total, 10.

Meningitis, meningococcal, was reported from: Boston, 1; Fitchburg, 1; Lynn, 1; total, 3.

Meningitis, Pfeiffer-bacillus, was reported from: Boston, 2; Cambridge, 1; Chicopee, 1; Fitchburg, 1; Lowell, 1; Medford, 1; Northampton, 1; total, 8.

Meningitis, pneumococcal, was reported from: Cambridge, 1; total, 1.

Meningitis, other forms, was reported from: Boston, 2; Sudbury, 1; total, 3.

Meningitis, undetermined, was reported from: Brockton, 1; Cambridge, 1; Great Barrington, 1; Holbrook, 1; Northampton, 1; Springfield, 1; Wrentham, 1; total, 7.

Salmonellosis was reported from: Belmont, 1; Beverly, 1; Boston, 1; Grafton, 1; Lowell, 1; Quincy, 1; Revere, 1; Somerville, 2; Waltham, 2; Winchendon, 2; Worcester, 1; total, 14.

Septic sore throat was reported from: Boston, 7; Grafton, 1; Merrimac, 1; Taunton, 1; total, 10.

Trichinosis was reported from: Boston, 2; total, 2.

Tularemia was reported from: Springfield, 1; total, 1.

Typhoid fever was reported from: Quincy, 1; total, 1.

Undulant fever was reported from: Ashburnham, 1; Foxboro, 1; Ludlow, 1; Newton, 1; Paxton, 1; Weymouth, 1; Worcester, 2; total, 8.

CONSULTATION CLINICS FOR CRIPPLED CHILDREN IN MASSACHUSETTS UNDER THE PROVISIONS OF THE SOCIAL SECURITY ACT

Clinic	Date	Clinic Consultant
Salem	July 7	Paul W. Hugenberger
Gardner (Worcester Subclinic)	July 8	John W. O'Meara
Pittsfield	July 9	Frank A. Slowick
Brockton	July 10	Geoge W. Van Gorder
Worcester	July 18	John W. O'Meara
Hyannis	July 24	Paul L. Norton
Fall River	July 28	David S. Grice

Physicians referring new patients to clinics should get in touch with the district health officer to make appointments.

REPORT OF MEETING

MASSACHUSETTS CENTRAL HEALTH COUNCIL

The annual meeting of the Massachusetts Central Health Council was held on May 1. The topic for discussion concerned local health councils, and the work of several of the more active local health councils was described.

Speaking for the Boston Health League, Miss Margaret Tracy stressed the importance for Boston of continuing the school-lunch program, as conducted in the Boston public schools by the director for school lunches, Miss Upham. The Health League has an active Committee on School Hygiene under the chairmanship of Dr. Charles H. Bradford. This committee is now studying problems relating to lunchroom services in the public schools of Boston. Another committee of the Boston Health League, under Mr. Horace Morison, is working on the question of reorientation of the work of the League in order that its usefulness may be increased.

The Health Committee of the Needham Community Council has been functioning for only one year, but Mrs. Francis K. Dermody was able to report that this committee has already been instrumental in the establishment of a much needed dental clinic.

Dr. Henry Godfrey, chairman of the Division of Hygiene of the Newton Community Council, reported that his committee has been successful in promoting x-ray examinations for tuberculosis among factory workers, has prepared health posters, is planning first-aid services for factories, is engaged in cancer instruction for the public and is active in the field of nutrition.

Reporting for the Health Division of the Wellesley Community Council, Prof. Curtis M. Hilliard spoke of its service in an advisory capacity to men and women who have served in the armed forces; he also stressed its unique type of mental-health program; and its co-operation with the Board of Health in the field of dental work and accident prevention. Each problem has been approached systematically. The first step is to study the matter, and the second to confer with all agencies involved and to formulate a program; the final step is to promote the program through interpretation to the public. Professor Hilliard summed up by saying, "It is hard to see, now that we have a community council, how we could have gotten along without one."

Dr. James O. Wails, city health officer of Worcester, spoke for the four-year-old Health Division of the Worcester Community Council. Its groups cover the family and child, park and recreation, health, nutrition, crippled and handicapped and miscellaneous. The nutrition group brought the various nationalities together and secured better relations among them. The health division, by pushing, has doubled the budget for child guidance. The health group has done much to promote harmony and co-ordination of health programs in Worcester.

Mrs. Eleanor S. Washburn, director of the recently organized Massachusetts Community Organization Service, spoke briefly of its aims. She said that its purposes are to provide state-wide advisory services to communities concerning the basic requirements for sound, well rounded health, welfare, educational and recreational programs, to work for better co-ordination of the state-wide agencies, both tax and privately supported, to promote local community planning co-ordinated with state planning, to give or secure technical assistance with community surveys and to provide an information service concerning social and health resources. Mrs. Washburn believes that her organization can assist the Central Health Council in its program for strengthening the organization of local health councils in the many localities in which health councils have not yet been formed.

In opening the discussion, Dr. Elmer S. Bagnall, past-president of the Massachusetts Medical Society, stressed the great potential value of local health councils and expressed his interest in this phase of the program.

Mr. A. J. Strawson pointed out the importance of careful planning of the program in order that the interest of those participating may be fruitful and sustained.

Initial indifference and apathy, said Professor Hilliard, are inevitable, but they can be overcome by enthusiasm.

Dr. Hugh R. Leavell said that health councils should be organized on a voluntary basis and that adequate attention should be given to financing them.

At the business meeting of the Council the resignations of the president, Dr. George C. Shattuck, and of the vice-president, Dr. Channing Frothingham, were presented. The officers elected for the ensuing year were: Dr. Hugh R. Leavell, president; Dr. David L. Belding, vice-president; and Mr. Arthur J. Strawson, secretary-treasurer.

NOTICES

ANNOUNCEMENTS

Dr. Irving E. Goldberg, whose office is at 270 Commonwealth Avenue, Boston, announces that he has recently become a member of the Boston Anesthesia Service.

Dr. Sydney Grace announces the removal of his office for the practice of obstetrics and gynecology to 475 Commonwealth Avenue (Lister Building), Boston.

Dr. Otto Kant announces the opening of an office for the practice of neuropsychiatry at 19 Bay State Road, Boston. He is also retaining his Worcester office.

Dr. John C. Tate, who has returned from military service, announces the reopening of an office at 83 State Street, Springfield, for the practice of surgery.

(*Notices continued on page xiii*)